

# SUPPLEMENT.

## The Mining Journal, RAILWAY AND COMMERCIAL GAZETTE:

FORMING A COMPLETE RECORD OF THE PROCEEDINGS OF ALL PUBLIC COMPANIES.

[The MINING JOURNAL is Registered at the General Post Office as a Newspaper, and for Transmission Abroad.]

No. 2555.—Vol. LIV.

LONDON, SATURDAY, AUGUST 9, 1884.

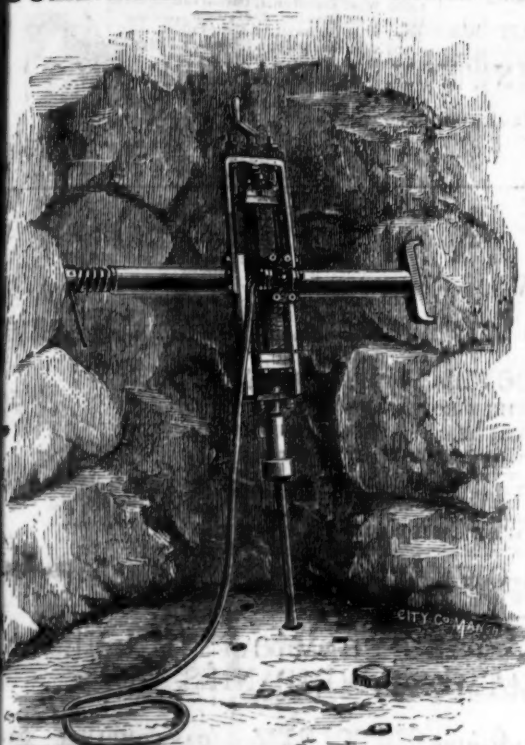
PRICE (WITH THE JOURNAL) SIXPENCE  
BY POST £1 4s. PER ANNUM.

HIGHEST SILVER MEDAL, ROYAL CORNWALL POLYTECHNIC  
—Highest Award for Effectiveness in Boring, and Economy in  
the Consumption of Air.

JUBILEE EXHIBITION, 1882.

THE PATENT

"CORNISH" ROCK DRILL.



HIGHEST SILVER MEDAL AWARDED AT BORING COMPETITION, DOLCOATH MINE, 1881.

The "CORNISH" ROCK DRILL and "CORNISH" COMPRESSOR

are now largely in use, and in every case are giving entire satisfaction.

For Testimonials, Illustrated Catalogues and prices, apply to—

HOLMAN BROTHERS,  
CAMBORNE FOUNDRY,

MAKERS OF

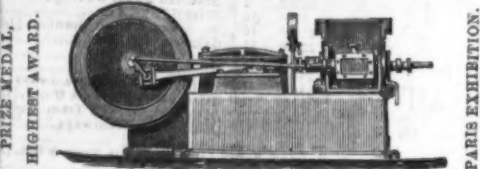
SHELL & TREGONING'S PATENT PULVERISER, and HOLMAN'S IMPROVED STEAM or AIR PUMPING and WINDING ENGINE for Underground Quarries or Shallow Mining. Indispensable for soft Sinking with Rock Drills. Also makers of all kinds of MINING MACHINERY at

THE CAMBORNE FOUNDRY AND ENGINE WORKS, CAMBORNE, CORNWALL.

THE PATENT  
"ECLIPSE" ROCK-DRILL

"RELIANCE AIR-COMPRESSOR."

Highest Silver Medal awarded at Boring Competition, East Pool Mine, Sept. 1883.



ARE NOW SUPPLIED TO THE  
ENGLISH, FOREIGN, AND COLONIAL GOVERNMENTS  
And are also in use in a number of the  
LARGEST MINES, RAILWAYS, QUARRIES, AND HARBOUR  
WORKS IN GREAT BRITAIN AND ABROAD

FOR ILLUSTRATED CATALOGUE AND PRICES, apply to—  
ATHORN & CO., 22, Charing Cross, London, S.W.

STEPHEN DAVIDSON,  
TIMBER MERCHANT, MORPETH,  
wishes to correspond with Company Promoters to establish Company  
to purchase land formerly occupied by an extensive  
Timber firm near Morpeth Station.

to carry on the Business as TIMBER MERCHANTS, SAW MILL  
PROPRIETORS, and GENERAL WOOD TURNERS.  
First-class situation. Railway alongside. Certain to pay a large  
dividend.

BUSINESS READY MADE.

THE MINING RECORD, Only \$5-00 a year.  
Foreign Postage.  
81, BROADWAY, NEW YORK.

the ONLY PAPER in the United States that gives FULL LATEST ACCOUNT  
of all the GREAT GOLD, SILVER, IRON, and COAL MINES of AMERICA.  
ORDERS EXECUTED FOR MINING STOCKS. Information free  
ALEX. ROBT. CHISHOLM, Proprietor.  
London Office—H. CARTER, Manager, 36, King William-street, London.

PATENT IMPROVED  
"INGERSOLL ROCK DRILL."

MEDALS AND HIGHEST AWARDS

SEVEN YEARS IN SUCCESSION,  
FOUR IN ONE YEAR.

American Institute, 1872.  
American Institute, 1875.  
London International Exhibition, 1874.  
Manchester Scientific Society, 1875.  
Leeds Exhibition, 1875.  
Royal Cornwall Polytechnic, 1875.  
Rio de Janeiro Exhibition, 1875.  
Australia Brisbane Exhibition, 1876.  
Philadelphia Exhibition, 1876.  
Royal Cornwall Polytechnic, 1877.  
Mining Institute of Cornwall, 1877.  
Paris Exhibition, 1878.

AWARDED FOR  
SIMPLICITY IN CONSTRUCTION.

AUTOMATIC FEED

(Perfect success)

GREAT STEADINESS.

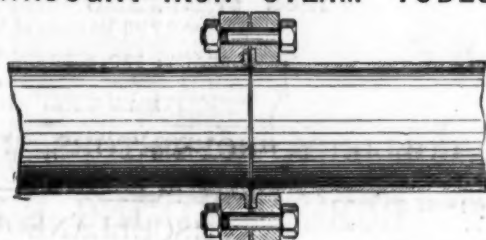
GREAT POWER.

GREAT DURABILITY.

GREAT EFFECTIVENESS.



WROUGHT-IRON STEAM TUBES.



Estimates given for Air Compressors and all kinds of Mining Machinery. For Illustrated Catalogues, Price Lists, Testimonials, &c., send to—

LE GROS, MAYNE, LEAVER & CO.  
60, Queen Victoria Street, London, E.C.

ROCK DRILLS  
FOR  
HAND AND POWER.



DUNCAN BROS.,  
32, QUEEN VICTORIA STREET,  
LONDON, E.C.

PERFORATED SHEET METALS

FOR

TIN, LEAD AND COPPER MINES,

MILLERS, BREWERS, AND

MALSTERS,

COLLIERIES AND

QUARRIES,

COFFEE ROASTERS

AND

SUGAR REFINERS.

ALDRED & CO.,

WORKS: PARKER STREET, ASHLEY LANE,  
MANCHESTER

THE  
"Barrow" Rock Drill

COMPANY.

HOSKING AND BLACKWELL'S PATENT.



SUPPLY their CELEBRATED ROCK DRILLS, AIR COMPRESSORS, &c., and  
all NECESSARY APPLIANCES for working the said Drills.

The DRILLS are exceedingly STRONG, LIGHT, SIMPLE, and adapted for ends  
slopes, quarries, and the sinking of shafts. They can be worked by any miner

Their DRILLS have most satisfactorily stood the TEST of LONG  
and CONTINUOUS WORK in the HARDEST KNOWN ROCK in  
numerous mines in Great Britain and other countries clearly proving  
their DURABILITY and POWER.

About 200 are now at work driving from three to six times the  
speed of hand labour, and at from 20 to 30 per cent. less cost per  
fathom. They can be worked by any miner.

For PRICES, Particulars and Reports of Successful and Economical  
Working, apply to—

LOAM AND SON,  
LISKEARD, CORNWALL.

THE PATENT  
"Cranston" Rock Drill,

AIR COMPRESSOR, AND DEEP BORING  
MACHINERY.

For prices, and particulars of rapid and economical work accomplished, apply to

J. G. CRANSTON,

22, GREY STREET NEWCASTLE-ON-TYNE.

PATENT PULVERIZER.

NEW SYSTEM.



JORDAN'S PATENT

ANY MATERIAL REDUCED TO ANY DEGREE  
OF FINENESS WITHOUT SIEVING

CAN ALWAYS BE SEEN AT WORK.

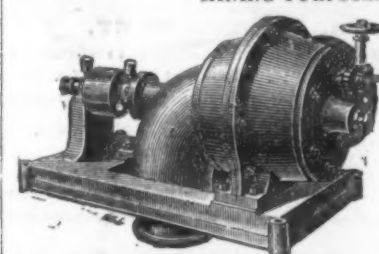
SOLE MANUFACTURERS.

T. B. JORDAN, SON, & COMMANS,  
52, GRACECHURCH STREET, LONDON, E.C.

WATER POWER,

UTILISED WITH THE GREATEST ECONOMY AND  
EFFECT BY THE PATENT "TRENT" TURBINE.

As arranged, with a horizontal spindle, it is specially adapted for  
MINING PURPOSES.



Catalogues on applica-  
tion to the sole Bri-  
tish Maker,

C. L. HETT,  
ANCHOLME  
FOUNDRY,  
BRIGG,  
ENGLAND.

The Patent Trent, New  
American Hercules, &  
Victor Turbine.



FIRST AWARD.  
SYDNEY, 1879.

BICKFORD'S PATENT FUSES

FIRST AWARD.  
MELBOURNE, 1881.



FOR CONVEYING FIRE TO THE CHARGE  
IN BLASTING ROCKS &c. &c.  
OBTAINED THE FOLLOWING MEDALS



FOR SIMULTANEOUS BLASTING.



SILVER MEDAL OF THE MINING INSTITUTE OF CORNWALL, TRURO, 1880,  
for an Improved Method of Simultaneous Blasting.

**BICKFORD, SMITH AND CO.,**

THE INVENTORS, AND ORIGINAL PATENTEES AND MANUFACTURERS OF

**SAFETY AND INSTANTANEOUS FUSES AND IGNITERS**

FOR USE IN ALL BLASTING OPERATIONS AND SPECIALLY PREPARED FOR ANY CLIMATE

Note the **TRADE MARK**: Two Separate threads through centre of Fuse.

BICKFORD, SMITH AND CO.'S Patent Igniters and Instantaneous Fuses for simultaneous blasting are being extensively used at home and abroad. This improved method is the cheapest, simplest, and most dependable ever introduced for simultaneously firing any number of charges. For full particulars, see Descriptive Catalogue.

PRICE LISTS, DESCRIPTIVE CATALOGUES, AND SAMPLES TO BE HAD ON APPLICATION.

FACTORIES—TUCKINGMILL CORNWALL; AND ST. HELENS JUNCTION, LANCASHIRE.

HEAD OFFICE—TUCKINGMILL, CORNWALL.

LANCASHIRE OFFICE—ADELPHI BANK CHAMBERS, SOUTH JOHN STREET, LIVERPOOL.

LONDON OFFICE—85, GRACECHURCH STREET, E.C.

Every package bears Bickford, Smith, and Co.'s copyright label.

**R. S. NEWALL AND CO.,**

Sole Patentees of Untwisted Wire Rope.

**Iron & Steel Ropes of the highest quality for Collieries,  
Railways, Suspension Bridges, &c.**

PATENT STEEL FLEXIBLE ROPES AND HAWSERS.  
IRON STEEL, AND COPPER CORDS. LIGHTNING CONDUCTORS.  
COPPER CABLES of high Conductivity for Electric Light and Power.

London: 130, STRAND, W.C. Liverpool: 7, NEW QUAY.

Glasgow: 68, ANDERSTON QUAY.

MANUFACTORY: GATESHEAD-ON-TYNE.

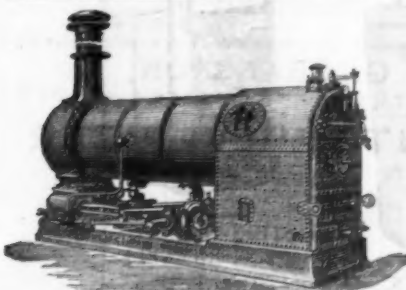
NOTICE TO COLLIERY PROPRIETORS, MINE OWNERS, &c.

The **PATENT "ROBEY" MINING ENGINE** is complete in itself, ready for putting down and setting to work, either as a Permanent or Temporary Winding or Pumping Engine.

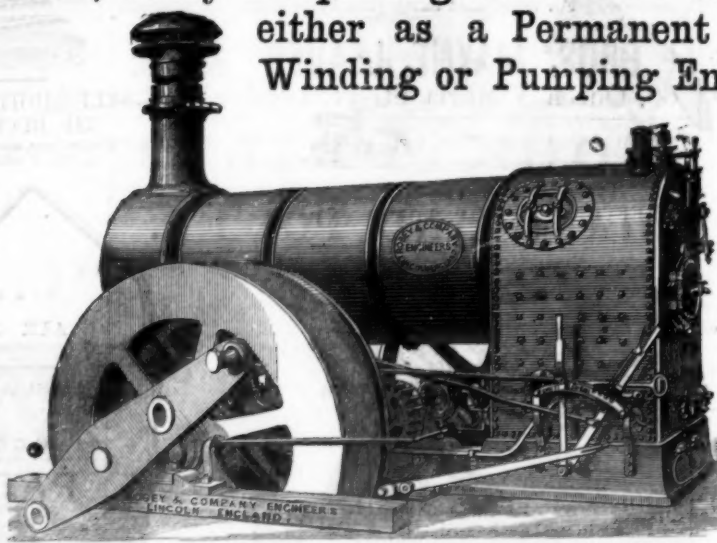


Robey's Superior Portable Engines,  
4 to 50-h.p.

LONDON OFFICES:—  
**117, Cannon Street, E.C.**



The Improved Robey Fixed Engine and  
Locomotive Boiler Combined,  
4 to 65-h.p.



ALL SIZES KEPT IN STOCK FROM 6 TO 50-H.P. NOMINAL.

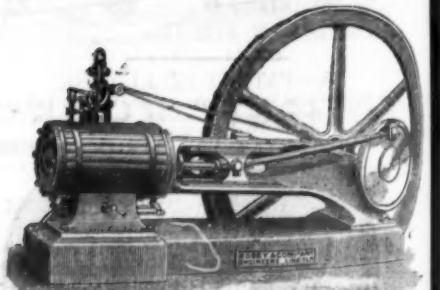
Please note this is the Original "ROBEY" Engine as designed and manufactured by Messrs. ROBEY and Co., of Lincoln. All others are mere attempts at imitation.

For particulars and prices apply to the Patentees and Sole Manufacturers—

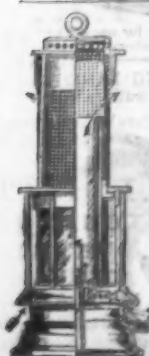
**ROBEY & CO., ENGINEERS, LINCOLN.**



Robey's Vertical Stationary Steam  
Engine, 1 1/2 to 16-h.p.



Robey's Horizontal Fixed Engines,  
4 to 60-h.p.



ESTABLISHED 1820.  
**JOSH. COOKE AND CO.,  
SAFETY LAMP**

AND  
GAUZE MANUFACTORY,  
Honourable Mention, Paris Exhibition, 1878

Illustrated Price Lists free, by post or otherwise.

**MIDLAND DAVY LAMP WORKS,  
Belmont Passage, 209, Lawley-street,  
BIRMINGHAM.**

Makers of Williamson's Double Safety Lamp,  
Williamson's Patent Double Safety Lamp shown half in  
section.

Medal—For Improved Invention—London, Kensington, 1874.  
Ditto—Excellence of Workmanship—Wrexham, 1867.

**BRITISH AND FOREIGN SAFETY FUSE COMPANY,**

WORKS: REDRUTH, CORNWALL,

MANUFACTURERS OF

**PATENT SAFETY FUSE FOR ALL KINDS OF BLASTING PURPOSES,  
For MINING & RAILWAY OPERATIONS,**

ALSO FOR

**ALL KINDS OF SUBMARINE WORK.**

This FUSE is made for ALL CLIMATES, and of any length and sufficient  
water-resisting properties to ensure ignition at any depth.

For PRICE LISTS, SAMPLES, &c., apply at the Works, or

LONDON OFFICES—3 and 4, Adelaide Place, King William Street, London Bridge, E.C.  
TRADE MARK,—TRICOLOUR COTTON (Red, White, and Blue), running through the column of Powder.





# R. HUDSON'S Patent Steel Trucks, Points and Crossings, PORTABLE RAILWAY, STEEL BUCKETS, &c., &c.

Telephone No. 14.

In connection with the Leeds Exchange, and all the principal Hotels and places of business in the town.

## GILDERSOME FOUNDRY, NEAR LEEDS.

(Near Gildersome Station, G.N.R. Main Line, Bradford to Wakefield and London, via Laisterdyke and Ardsley Junctions.)

Registered  
Telegraphic Address:—  
"GILDERSOME,  
LEEDS."  
A. B. C. Code used.

UPWARDS of 25,000 of these Trucks and Wagons have been supplied to the South African Diamond Mines; American, Spanish, Indian, and Welsh Gold, Silver, Copper, and Lead Mines; Indian and Brazilian Railways, and to Railway Contractors, Chemical Works, Brick Works, and Coal and Mineral Shippers, &c., &c., and can be made to lift off the underwork, to let down into the hold of a vessel, and easily replaced. They are also largely used in the Coal and other Mines in this country, and are the **LIGHTEST, STRONGEST, and most CAPACIOUS** made, infinitely stronger and lighter than wooden ones, and are all fitted with R. H.'s Patent "Rim" round top of wagons, requiring no rivets, and giving immense strength and rigidity. End and body plates are also joined on R. H.'s patent method, dispensing with angle-irons or corner plates.

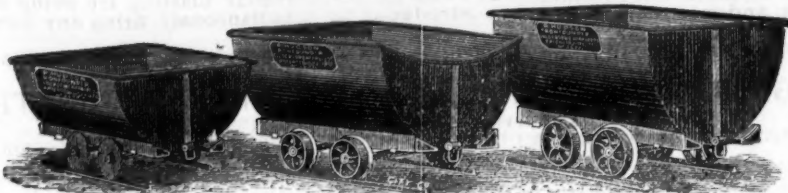
Patented in Europe, America, Australia, India, and British South Africa, 1875, 1877, 1878, 1881, and 1883.  
N.B.—The American, Australian, Indian, and Spanish Patents on sale.

### CAN BE MADE TO ANY SIZE, AND TO ANY GAUGE OF RAILS.

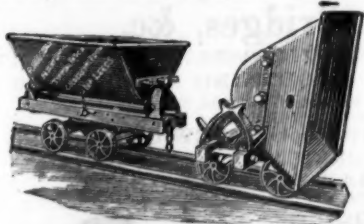
1.—PATENT STEEL END TIP WAGONS.



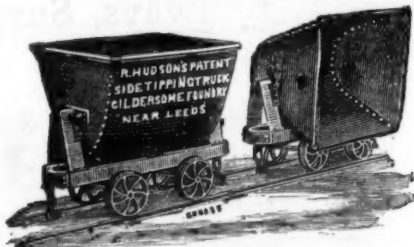
7.—PATENT STEEL MINING WAGONS.



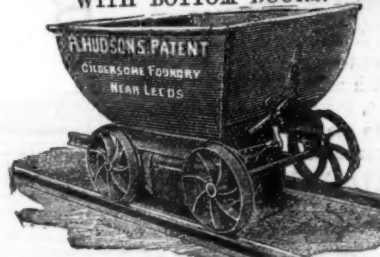
2. PATENT UNIVERSAL TRIPLE-CENTRE STEEL TIPPING TRUCK,  
Will tip either side or either end of rails.



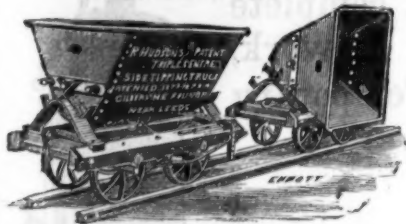
8.—PATENT DOUBLE-CENTRE STEEL SIDE TIP WAGONS,  
Will tip either side of Wagons.



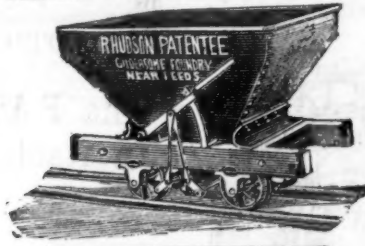
12.—PATENT STEEL HOPPER WAGON,  
WITH BOTTOM DOORS.



3.—PATENT TRIPLE-CENTRE STEEL SIDE TIP WAGONS.



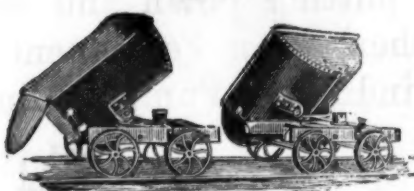
13.—PATENT STEEL HOPPER WAGON.



4.—PATENT STEEL PLATFORM OR SUGAR CANE WAGON.



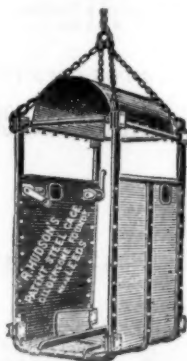
9.—PATENT STEEL ALL-ROUND TIP WAGON.



14.—SELF-RIGHTING STEEL TIP BUCKET.  
(The "CATCH" can also be made SELF-ACTING if desired.)



15.—STEEL CAGE.



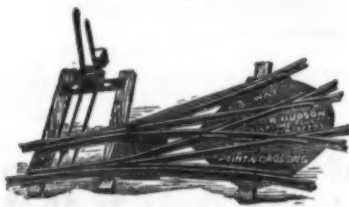
5.—PATENT STEEL CASK.  
As supplied to H.M. War Office for the late war in Egypt).  
DOUBLE the STRENGTH of ordinary Casks without any INCREASE in weight.  
(Made from 10 gals. capacity UPWARDS to any desired size.)



10.—LEFT-HAND STEEL POINT AND CROSSING.

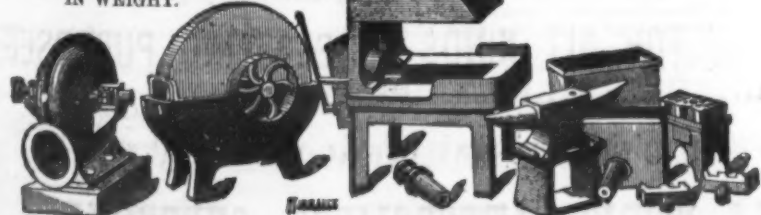


11.—RIGHT AND LEFT-HAND STEEL POINT AND CROSSING.



6.—ROBERT HUDSON'S  
PATENT IMPROVED IRON SMITH'S HEARTH,  
NO BRICKWORK REQUIRED.

A Special quality made almost entirely in STEEL, effecting a GREAT SAVING IN WEIGHT.



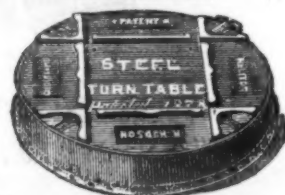
Large numbers in use by all the principal Engineers in this country and abroad.

16.—PATENT STEEL WHEELBARROWS.  
Made to any Size.  
Lightest and Strongest in the Market.



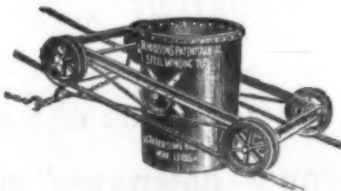
A great success.

17.—STEEL SELF-CONTAINED TURNTABLE.



(Also made in CAST IRON for use where weight is not a consideration.)

18.—"AERIAL" STEEL WINDING TUB.



Largely employed in the South African Diamond Fields.

No. 19.—PATENT STEEL CHARGING BARROW,  
DOUBLE the STRENGTH & much LIGHTER than ordinary Barrow.



ALL KINDS OF BOLTS NUTS, AND RIVETS MADE TO ORDER ON THE PREMISES



Hadfield's Sheet of Drawings.

List No. 28a.

# HADFIELD'S STEEL FOUNDRY COMPANY,

ATTERCLIFFE, SHEFFIELD.

GOLD MEDAL.



Gold Medal, Paris, 1878.

Gold Medal, Madrid, 1883.



Contractors to H. M. Home, India, and Colonial Governments; Home, Foreign, and Colonial Railways, Admiralty, War Departments, &c.

GOLD MEDAL.



Gold Medal, Melbourne, 1881.

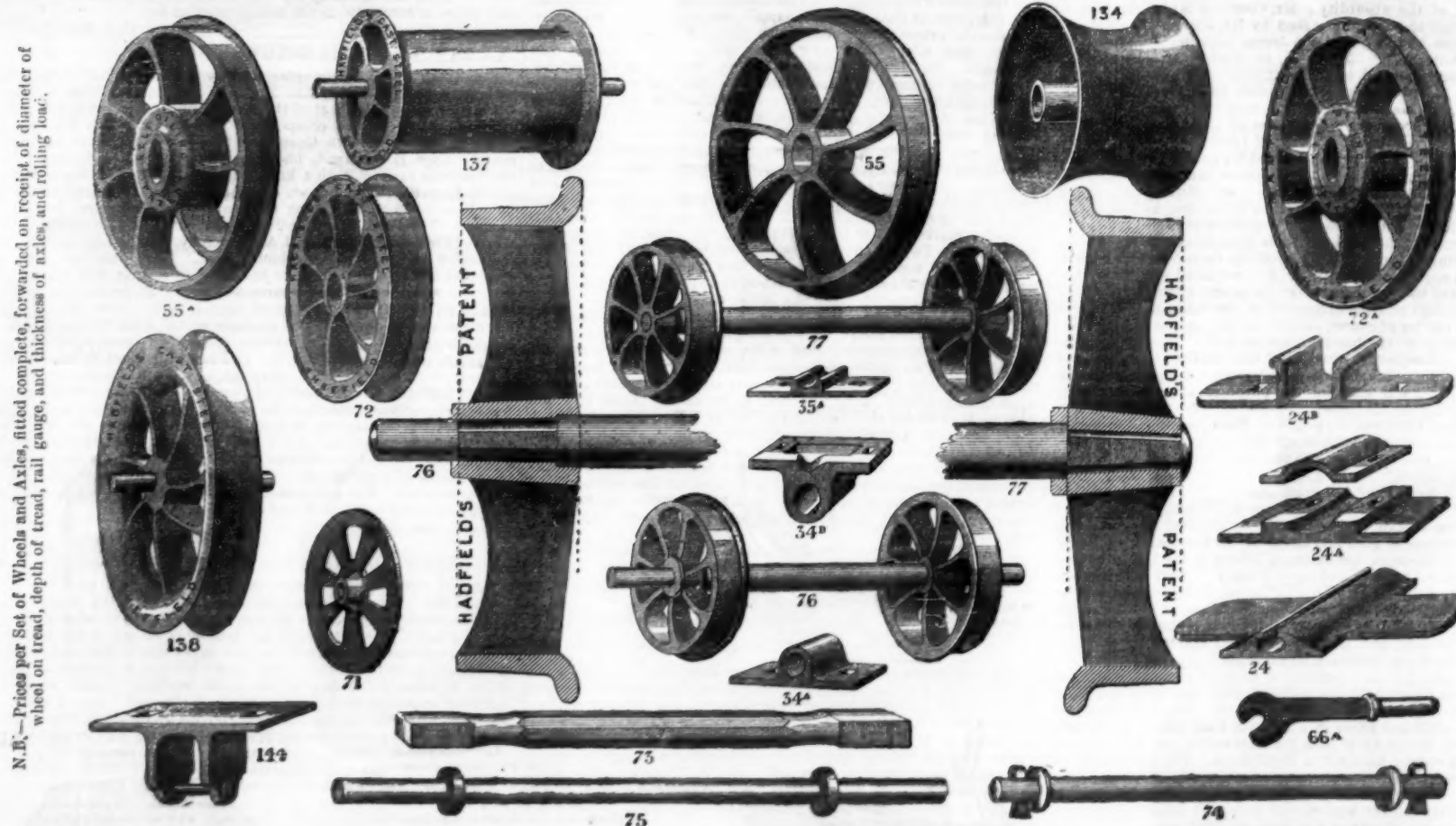
Special Diploma of Honour and Silver Medal, Sydney, 1880.  
HIGHEST AWARDS, LEEDS, MANCHESTER, WREXHAM, CORNWALL, &c.

## ▷ HADFIELD'S CAST STEEL WHEELS. ◁

One of our departments is specially adapted for the production of our Patent Steel Wheels and Axles for collieries, tramways, ironstone mines, slate quarries, ironworks, lead mines, &c., and we are now manufacturing 2000 per week. Owing to our patent system of fitting-up Wheels and Axles, which is simple but effective, we are enabled to execute orders with promptitude. We undertake to supply all work entrusted to us in a first-class manner, and only manufacture the best quality of material. OVER 1800 DIFFERENT WHEEL, PULLEY, AND PEDESTAL PATTERNS IN STOCK, of varying widths of tread, flanges, &c., any of which can be ready for use at the shortest notice.

In addition to the now universally admitted superiority of Hadfield's steel wheels over those of cast-iron for lightness, strength, and wearing qualities, we claim the following SPECIALITIES for our material over any other steel, malleable iron, or other wheels, viz.:-

Extra TOUGHNESS or TENACITY, DURABILITY, and SOLIDITY: for proof of this kindly see advertisement marked "List No. 28."



N.B.—Prices per Set of Wheels and Axles, fitted complete, forwarded on receipt of diameter of wheel on tread, depth of tread, rail gauge, and thickness of axles, and rolling load.

We also solicit attention to the following articles, which, in addition to our well-known Patent Steel Wheels and Axles, we are now largely supplying in our CAST STEEL, on account of their great strength combined with durability and lightness.

**Rollers, Pulleys, Frames, and Stands.**—See our lists of over 240 different patterns. They possess great durability, lightness, and strength, and add considerably to the life of the steel or other ropes.

**Self-oiling Wheels (Patent).**—Many thousands now at work. Save at least 50 per cent. of oil or grease. Easily charged or refilled. Reduce friction and wear and tear to a minimum.

**Pedestals, Bushes, Cage Guides, Buffer Boxes, Points, Crossings, and other Colliery Castings** of every description.

Over 1700 different patterns of above in stock, ready for use on the shortest notice. New patterns made to suit special requirements free of charge for quantities.

**Steel Axles** to suit all classes of haulage. We manufacture a special mild quality of steel suitable for this purpose, and have many hundreds of thousands in daily use giving every satisfaction.

**Steel Gearing** of all kinds. Machine moulded or from full patterns.

**Miscellaneous Steel Castings**, up to 16,000 lbs. each, to replace expensive wrought-iron and steel forgings and heavy iron castings. Tensile strain of our castings 35 to 65 tons per square inch (as tested by Government) varying according to purpose required, with 20 per cent. elongation.

**Note.**—Beware of spurious and cheap imitations which eventually work loose, causing great loss and annoyance, as well as bringing discredit on the name of Steel Wheels and Axles. We are constantly replacing such. See, therefore, that Hadfield's name is on every wheel.

N.B.—Note the Address, and prove truth of the above by giving our Steel Wheels, &c., a trial.

**HADFIELD'S STEEL FOUNDRY COMPANY, HECLA WORKS, ATTERCLIFFE, SHEFFIELD.**

Copyright.

All rights reserved.



## Original Correspondence.

## GOLD IN WALES—(CROWN LEASES)—No. XLVIII.

SIR,—I believe I had the honour of holding from the Queen's Most Excellent Majesty the first lease to search for gold in the county of Merioneth. This was in 1853, and at times, since then, the readers of your Journal must have been weary of my pertinacious adherence to the opinion reiterated at the head of this communication. It was, therefore, truly refreshing to have it from the lips of Mr. Courtney in the House of Commons the other night that "the one-fourth clause of Crown mineral leases is now no longer inserted, and that the Commissioners of Woods and Forests are especially anxious to develop their mining properties." That this has not always been the case "goes without saying."

For the information of those who may not know what this "one-fourth clause" is I transcribe it from a license granted to myself in 1881. It runs as follows:—"And it is hereby expressly agreed and declared that if and so often as the said lessee, his executors, administrators, or assigns, shall receive or become entitled to any sum of money or other consideration for or in relation to the granting of any lease pursuant to these presents, or for or in relation to any sale, underlease, or other disposition, or any agreement for any sale or underlease or other disposition or any declaration of trust of any estate or interest, whether legal or equitable, to which he or they may be entitled by virtue of these presents or of any lease to be granted pursuant thereto then, and in every such case Her Majesty, her heirs, and successors shall be entitled to receive and recover from the said lessee, his executors, administrators, or assigns, one-fourth part of the amount of such sum of money or other consideration, or of the estimated value thereof after deducting from the gross amount of such sum of money, or other consideration, the net expenses which may have been incurred by the said lessee, his executors, administrators, or assigns in searching for and working the said substances, hereby demised, he and they giving credit for any receipts therefrom; and where any such consideration as aforesaid, or any part thereof, shall consist of any stock, shares, or other interest in any company or partnership, then the estimated value of such stock, shares, or interest shall be taken to be the nominal amount thereof, and as if the same were already fully paid up or subscribed. And it is hereby declared to be the intention of these presents that no lease shall be granted pursuant to these presents, and that no consent to any assignment, under-lease, or other disposition by the said lessee, his executors, administrators, or assigns of these presents, or the lease to be granted pursuant thereto, or the substances hereby demised, or any interest comprised therein, or confirmed thereby, shall be given by the said Commissioner or Commissioners until after or contemporaneously with the payment to Her Majesty of the proportion of any such sum of money or other consideration to which Her Majesty may become entitled as aforesaid; and in case any question shall arise as to the amount or estimated value of any such sum of money, or other consideration, expenses, or receipts, as aforesaid, then every such question shall be determined by the Receiver of the Land Revenues of the Crown in Wales, whose award in writing, under his hand, shall be final and conclusive."

As to this "one-fourth clause," the candid reader of it can scarcely feel feeling astonished at two things: first, that any such unfairness should have been perpetrated in Her Majesty's name, and, secondly, that anybody could be found infatuated enough to accept the conditions! If, however, the obnoxious clause has been abandoned, there is an end of the absurdity. Mr. Courtney is also reported to have said, in reply to a question asked by Mr. John Rolls, M.P., "I have no evidence to show that the terms required by the Crown in mining enterprise." Mr. Rolls, no doubt, can easily satisfy Mr. Courtney on this head to the contrary. The parishes I know most about in Merionethshire are Llanaber, Llanelltydd, and Llanfachreth, and in this district, which may be described as the Mawddach Valley, are about 11,000 acres of Crown lands, split up into 50 portions of very unequal area and value, all of which I have more or less carefully surveyed and tested for gold, silver, &c., and I do not hesitate in saying that some of these sets are of considerable value, whilst others are worthless, or nearly so. But as the case now stands, who would pay 500*l.* to take them for a year, and bind himself to spend 5000*l.* within the time in explorations?

As this subject has unexpectedly come prominently to the fore, it may be interesting if I reiterate some of the facts connected therewith. An idea appears constantly to have prevailed that the gold of this country was by no means of insignificant quantity or value. The aversion of Kings and the exigencies of the State, as soon as possible, and, as a matter of course, laid claim, not only to the gold and silver found, but to all the baser metals as well. These pretensions were, however, subsequently abandoned, and the Crown was divested of all rights in minerals except gold and silver, these precious metals being retained, as it was said, for the purposes of coinage, and to support the dignity of the Crown. (Ploeden, 338; Black, "Com."; Stephens' Edition, 1858, vol. ii., p. 556.) That great legal authority, Sir Edward Coke, laid down the law, "that veins of gold and silver in the grounds of subjects belong to the King, by his prerogative, for they are Royal mines." ("Inst., 132: 2 "Inst., 576, 1861.) And the Justices and Barons in "the great case of mines" (1568) unanimously agreed (see "The Law relating to Mines, Minerals, and Quarries in Great Britain and Ireland." By Arundel Rogers) "that by the law, all mines of gold and silver within the realm, whether in the lands of the Queen or her subjects, belong to the Queen by prerogative, with liberty to dig and carry it away." And so firmly was the prerogative of the Crown thus established, that it was agreed that a Royal mine could not be severed from the Crown; but the judges overruled this. The only doubt existing in the time of Elizabeth was, whether "if gold and silver were found intermixed with the baser metals, the whole became a Royal mine."

Some contended that any quantity of gold or silver so found was sufficient, whilst others held the opinion that the gold and silver must exceed in value the other metals, but the judges decided that even when the gold and silver in a mine of base metals in the land of a subject was of less value than the base metal, the mere circumstance of its existence makes it a Royal mine. The uncertainty of the law on this decision caused general distrust, and destroyed to a great extent this kind of enterprise; therefore, in the first year of William and Mary an Act was passed (cap. 30) wherein it was declared that no mine of copper, tin, iron, or lead, shall hereafter be adjudged a Royal mine, although gold or silver might be extracted out of the same. This provision also was soon considered insufficient, and in the fifth year of William and Mary an Act was passed (cap. 6), entitled "An Act to prevent disputes and controversies concerning Royal mines," wherein it was enacted that all persons being subjects of the Crown of England, owners of mines within the kingdom of England, dominion of Wales, or Berwick-upon-Tweed, wherein there is copper, tin, iron, or lead, may enjoy, the same notwithstanding said mines may be pretended or claimed to be Royal mines. But by the second statute the Crown, or any other person claiming royal mines under the Crown has the option of purchasing said ores before removal other than tin ore in the counties of Cornwall and Devon, upon payment of a price fixed by the said Act—copper, 13*l.*; tin, 2*l.*; iron, 2*l.*; and lead, 9*l.* per ton. By the 35 George III., cap. 134, the right of pre-emption which is given to the Crown, and those claiming under the Crown, so far as relates to lead, can only be claimed on payment of 25*l.* per ton, instead of 9*l.*, as previously fixed.

From this it appears—1. That the right of pre-emption given to the Crown is limited to copper, iron, and lead, wherever found, and to tin to be found in England, other than in Cornwall and Devon, if such ores contain gold or silver.—2. That the rights of the Crown to all mines where gold and silver exist, intermixed with any substance whatever other than copper, iron, lead, or tin, remain unaffected by either of the statutes of William and Mary.—3. That the rights of the subject to all mines of copper, lead, and tin, even if gold and silver be found therewith, is confirmed by the said statutes, subject only to the right of pre-emption just stated (Rogers v. Brenton, 10 Q.B., 49). But, if any other auriferous ores be discovered, it will

be difficult to determine the respective rights of the Crown and the subject to such a mine, unless "the great case of mines" should be adopted in favour of the Crown. Under any circumstances there is no provision made for such a discovery. Independently of this the law is not settled that pure gold and silver wherever found, are the absolute property of the Crown. It is, however, not a little remarkable that the Crown has no right of entry upon private lands to search for ores, nor has the Crown ever exercised its right of pre-emption as regards lead ore containing silver.

But since the gold discoveries in Wales in 1853 the practice of the Office of Woods and Forests has been somewhat as follows:—1. Where the gold is found in combination with other metals, the whole of which, with the necessary easements for working, are vested in the Crown; the Crown deals with the case in the same manner as with an ordinary license to search for minerals—30*l.* per annum minimum rent, and 1-12th royalty on the gold, with recently the "one-fourth clause" inserted, with the view of stopping mining speculation.—2. Where the gold is found in combination with the minerals specified in the Acts of William and Mary, and which are not vested in the Crown, the Crown has proposed to itself the acceptance of a royalty in lieu of its right of pre-emption.—3. Where the gold is found in a virgin state, or secreted in rocks, and not in combination with the ores and minerals specified in those Acts, on lands where the minerals are not vested in the Crown, the Crown asks the parties interested to take a license on payment of a nominal rent, and a royalty upon the gold raised. To comply with which there is neither legal nor moral obligation, as the Crown having no right of entry upon private lands cannot possibly give or sell any such right to another without the consent of the owner, who is never in the humour to give it.

At the present moment, as far as I know, there is not a mine in the district working under any of these conditions. The terms and conditions exacted or proposed by the Crown, as a general rule, are far too burdensome to encourage persons in this kind of adventure. The obnoxious one-fourth clause, as intended, became an effectual block to mining enterprise of this kind; many thousands of acres of Crown Lands are consequently unlet, therefore, totally unproductive; and of course remunerative labour has been withheld from a class of operatives whose occupation, at its best, is amongst the most risky and unpleasant. I have good reasons for believing that if the Crown would consent to impose a small annual rent, and a royalty (say) of 5 per cent. on the net profits, it would be agreed to readily, nearly all the Crown sets would be taken up for trial operations; explorations would be far more extensively made or permitted by persons on their own estates, and the Crown would not only be an annual gainer in rentals of its own mineral rights, but would also derive an income from lands upon which at present it has no right of entry to realise that to which it sets up such a very shadowy claim.

Some of the hindrances as to Crown mineral leases are:—1. The difficulty of access to the Crown maps.—2. The wretched abortions they seem when found.—3. The impossibility, sometimes, of identifying the spot required.—4. The high charge for a yearly license to search for minerals.—5. The imposition of 1-12th Royalty instead of 1-20th, as is the practice of the Duchy of Cornwall, or 1-24th or 1-30th as per sundry private owners.—6. The granting licenses to search for and work the baser minerals separately from gold and silver.—7. The granting licenses to search for and work gold and silver ores distinct from the baser ores, although at the same royalty.—8. The heretofore insertion in the license of the "one-fourth clause."

It is very gratifying to find this sudden removal of one of the greatest hindrances to Welsh mining adventure; as the mining for copper, lead, and zinc, at their present low values, stands no remunerative chance whatever, unless the minerals happen to be associated with the precious metals, which, happily, they sometimes are, to an appreciable extent, particularly with gold. There seems at last a chance once more for the "Royal Mines" of Cardigan and Merioneth. Sir Thomas Bushell, Knight, was no myth, and his Aberystwith coinage no counterfeit. His financial relations with the impecunious King Charles were munificently real; and the reality has in it a good deal of encouragement in the present depressing times. What man has done, as a rule, given equal opportunity, man can do; and it is dry matter of financial fact that Bushell was a friend in need and a friend indeed to that unfortunate monarch, and that he got silver enough in Cardiganshire and gold enough in Merionethshire to present "ninety thousand pounds sterling a year to His Majesty's use for five years, and sundry thousands of golden marks for His Majesty's private use," besides the following trifles:—"Twenty thousand *entres* of clothes for the Royal army," "ten thousand arms for the troops," "one hundred tons of lead to make bullets for them, a troop of horse to attend His Majesty's person, and 1000 stout miners for His Majesty's life guard."

Truly this was a heavy royalty to pay; but it was paid. Our most gracious Queen has received about 5000 guineas of gold royalty altogether out of Merioneth. But, if the remaining restrictions are abated, I have no doubt that Merioneth will yield far more gold than Bushell ever got; inasmuch as there are better means of doing it, and more people ready and willing to do it. True, it is not "felony to multiply gold and silver," as by 5 Hen. IV. c. 4; but it might just as well be by Royal permission to do it, as now given, is hedged round with restrictions, which are tantamount to prohibition. In my own knowledge there are hundreds of auriferous spots on Crown lands in Wales that are more or less worthy of attention; and many more known to others outside my favourite locality of the lovely Mawddach, and to be discovered. And there they lay idle.

In justification of my adverse criticism as to the conduct of the Crown's representatives in this matter, I need only refer direct to the prejudicial and almost total blankness on the Crown agents' maps as to mineral tenancy. This should not and need not be.

London, Aug. 4. T. A. READWIN, F.G.S.

## THE TRANSVAAL GOLD FIELDS.

SIR,—If elaborate and admirably illustrated reports of mining properties would but pay dividends from gold mines, what an extensive Dividend-list would appear in your columns, and what a brilliant array of staff officials would half-yearly parade before the delighted audiences of general meetings. The untold millions of tons of rich ore visible to the naked eye of the enthusiastic investigator, said to contain fabulous amounts of gold (in imagination), and which reads so well in illustrated pamphlets and reports, appear to shrink into insignificance when put to the practical test of crushing a few thousand tons in the stamp mills.

Your report of the Transvaal Exploration and Land Company shows "the quantity of quartz crushed at Brown's Hill to July 26 was 2091 tons, and the yield therefrom 1418 ozs. of gold, or an average of 13*l.* dwts. per ton, value 5317*l.* This quartz has been obtained from excavations by the diggers prior to the acquisition of the property by the company. It is desirable to explain that with it was associated a rich deposit of fine earth, containing the larger proportion of gold which the diggers were able to treat successfully during excavation, even with the primitive appliances at their disposal, leaving the quartz untouched."

The average of 13*l.* dwts. per ton is a good average yield if there is an ample supply of quartz to work on, and should be made to pay very well; but if the veins are only thin stringers of a few inches thick, and the quartz crushed appeared to be that left from the sluicing operations of former workers than the yield after the high anticipations given is no doubt disappointing. When enthusiastic engineers estimate millions of tons of ore in sight at high average yields in bulk of over an ounce to the ton, and the crushing of a picked quantity of clean quartz from the veins only produces 13*l.* dwts. per ton, it shows the fallacy of basing calculations on such a high scale without a practical test by crushing.

The report further says:—"It will, therefore, be understood that the yield from the above crushings does not represent the correct average value of the general auriferous deposits, which consist of quartz mingled with earth."

The report is very vague, and has a vein of amateur ideas of gold mining pervading it. Auriferous deposits generally consist of quartz mingled with earth. It is to be understood that the whole of the matrix, quartz, schist, slates, clay, &c., will average more than 13*l.*

dwts. per ton, and the pure clean quartz of the veins thrown out of the sluices by the former miners, which have been hitherto represented as fabulously rich will only yield in bulk the above average. If the bulk of the matrix is richer than the vein quartz why does not the manager operate on the larger and richer portions, and leave the poorer portions for future operations?

Throwing dust in the eyes of shareholders in England may be and is apparently a simple operation for some persons; but putting "gold dust" in their pockets would be much more satisfactory to them, and be the best proof of the practical ability of the superintendents or officers in charge of the mining operations.

If, as may be inferred from the tenor of the report, the "correct average value of the general auriferous deposits" is more than 13*l.* dwts. per ton, there is no necessity to resort to hydraulic operations, as with plenty of matrix to work on, plenty of water, and with efficient machinery, if a man cannot make a handsome profit on 13*l.* dwts. ore, he can never make any mine pay, as on such a yield as that at least 50 per cent. of the gross yield of gold should be profit.

If the properties in the Transvaal are of such "immense value, and that by systematic working success may be ensured," then in the name of common sense, why don't they commence with "systematic working," and thus "ensure success?" Why don't companies send practical men out to manage their properties instead of so many expensive theorists and experimentalists? ECHO.

## AKANKOO GOLD MINES.

SIR,—Reverting to the interesting letter from Mr. C. S. M. Dobson, which you gave to your readers on July 19, with reference to this property it will be at least as interesting to the directors and shareholders of this mine as it is to me, to learn that the mill and reduction works were practically completed more than a month ago. So far as my memory serves this—although one of the youngest of the mining enterprises on the West Coast of Africa—seems to be the first to be in a position to make returns to its shareholders, and with your kind permission I will endeavour to show why this is so. No doubt much is due to the energy and skill of Mr. Lane and his assistants, but I think the principal reason why these works have been completed in comparatively so short a time is that the directors decided—doubtless under advice from their engineer—to send everything from home as nearly complete as possible, leaving nothing to be done in Africa which could be done here. This course is somewhat unusual, but the result shows that in this instance it has been a proper one, and I think it must be so wherever skilled labour is expensive, and where, as on the West Coast of Africa, Europeans are subject to fever and sickness, as referred to in Mr. Dobson's letter.

It is also rather unusual for the engineer-in-chief to take the personal superintendence of the erection of the mill, this being too often left to mechanics, who, however good they may be as workmen, have not the wider and more comprehensive knowledge which is so valuable in dealing promptly with the problems which have to be solved, and to do work well and quickly without the aid of appliances and the ample supply of skilled labour which we have.

One word with regard to night work—the mill-house and concentrators, and even the boilers being under cover—I am inclined to think that day and night shifts may be worked without inconvenience, as is commonly done in the United States, Australia, and in other countries. Where this is practicable it is evident that the output will be doubled without increase in capital outlay, and but little in working expenses; and this was one of the considerations which induced the directors to send out such buildings.

Perhaps you will permit me to add that the mill and buildings were designed and made by my firm, and I only hope that the mine may prove as successful as the mill appears to be.

Cannon-street, Aug. 7.

C. J. APPELBY.

## THE CALLAO MINES.

SIR,—Will you allow me space to draw the attention of the shareholders to these mines, Callao Bis, New Callao, and West Callao. I will only refer to the last of these companies in respect to the prospects held out by the prospectus. The land held by the West Callao is 750 acres with Government lease for 50 years at 180*l.* rental. Capt. Robotham in his report on making the discovery of the first lode says—"With a knowledge of a vein of 2 ozs. per ton on the property I rest and am contented. Since then explorations have been made proving that there are on the property 16 lodes from 1 to 6 ft. thick, assaying 2 to 6 ozs. per ton." In addition to this we have a report from Mr. J. A. Skertchley, F.R.G.S., M. and C.E., a celebrated African explorer, which states—"That after six months residence on the mine I have no hesitation in stating that the ore is identical with the El Callao quartz, and will in all probability prove equally rich." This report is dated Sept. 1, 1882. Now turn to last week's *Mining Journal*—"The manager writes, June 28, that he had commenced crushing, and everything worked very well, when he was obliged to suspend operations for two or three days to repair the crusher, which was cracked." This manager has evidently read the reports from the Rhodes Reef and Devala Moya—not a week passed but something was cracked, or the buddles were wrong, or the stopping was imperfect, leading one to imagine that a change in the management would be desirable, and I might also add in the respective directorates. In the New Callao the manager has been delayed by the breaking of a piston-rod. In Callao Bis "the quartz taken out has visible gold. You are possessors of a valuable lode which only requires opening out." Nothing cracked in this mine.

Bury Cross, Gosport, Aug. 4.

PANGLOS.

## CROWN LEASES—THE ONE-FOURTH CLAUSE.

SIR,—I was surprised to read the absurd view you took with regard to the "one-fourth consideration clause" in the Woods and Forests leases, and I am sure all right-thinking people—shareholders and capitalists who put money into mining concerns in the hope of receiving at least some profit on the investment—will agree with Mr. Courtney that Crown mining leases are not more onerous than other Welsh mine leases, that the terms required by the Crown so far from impeding mining enterprise in Wales are rather a protection, and that the Commissioners of Woods and Forests display anxiety to develop their mining properties in every proper manner—the "one-fourth clause" affording the greatest encouragement to mining which was ever conceived, since by affording capitalists some slight guarantee that they will receive some return from their enterprise mining would be much encouraged. Were I a member of Parliament I would ask Mr. Courtney why so useful a clause was abandoned without the public discussion of the matter. I always supposed that the *Mining Journal* sought to protect capitalists, and if that be the Editor's intention I can only excuse him for his present blunder by remembering the truthful motto of the Royal Order of Antediluvian Buffaloes placed upon the silver salver presented as a testimonial to Mr. Robert Hunt, F.R.S., the honoured and indefatigable mining statist; it is to the effect that "no mortal is at all times wide awake." I should give the original Latin, but I know the Editor always prefers "plain English and no poetry," and that he printed my last poetical effusion as prose with capital letters in the middle of it. But now for the "one-fourth consideration clause."

The holder of an English Crown lease I regard as occupying the position of a "Concessionaire" in a foreign country. He obtains his grant upon nominal terms, the object of the Government being to secure the thorough and successful working of the mines, so as to ensure proper employment for the working miner and a profitable field for the employment of capital. Now, the obnoxious (?) clause merely provides that, "whenever the lessee becomes entitled to receive money or valuable consideration for the transfer of his rights, he shall pay fourth of such profit to the Government; but the lessee is indemnified for any outlay he may make in improving the property." This clause ensured the country receiving a proper price for the mines demised, and protected the capitalist against the cupidity of the middleman or original Crown lessee; for, as a matter of fact, the Crown lease is generally obtained by a professional company promoter with a view to the formation of a company. Let us take a specimen case:—We will call at the Cwmhelian-issa-Dolfrwyng Mine—the names of the mines in the counties mentioned by Mr. Rolls are usually somewhat complex. First, an amiable little gentle-



man, of most polite manner and charming fluency of speech and conversation—for brevity let him be designated Sir R. A. T.—applies at the office of Woods and Forests for a Crown lease of the Cwmheisan-issa-Dolfrwynog, and as his knightly bearing and plausibility give him immeasurable advantages over all competitors, the lease is granted to him. I do not say that Sir R. A. T. incurs no expense nor trouble—the fees would be under 100*l.*, and he would probably have expended in proving the mine to be worth applying for another 100*l.*; but, to give the knight the benefit of the doubt, let it be assumed that he is 1000*l.* out of pocket—200*l.* fees, 800*l.* expenditure on mine—and that a working capital of 25,000*l.* is required for developing the mine in a proper manner. Then allow Sir R. A. T. 50 per cent. for the risk and trouble he has incurred, and give the money agent 5 per cent. (the usual commercial commission is 2½ per cent.) and the account will stand somewhat thus:—

Capital subscribed by public	£30,000
Sir R. A. T.	£1,500
Money agent	1,500
Woods and Forests	1,050
Working capital	25,000=29,050

Balance for preliminary expenses and brokerage ..... £950

It need scarcely be explained that to constitute a limited company on this basis it would be stated in the Articles of Association that the purchase-money is fixed by the vendor and promoter at 5000*l.*, and it is upon this amount, after deducting the 800*l.* expended by Sir R. A. T., that the one-fourth for the Woods and Forests would be calculated. If Sir R. A. T. be capable of acting as his own money agent he would get 200 per cent. upon his outlay, which ought to satisfy him, and although the capital account is loaded to the extent of 90 per cent. the concern is not overweighed, for there are few mines which with 25,000*l.* of working capital honestly and judiciously expended would fail to return good dividends on 30,000*l.*, even with the metal markets in the present depressed state. So far, then, the "one-fourth clause" is not so very objectionable, since it gives the Government less for the lease than is demanded by those who co-operate to raise the funds for working. The real alteration required in Crown leases is with regard to the payment of royalty—the payment should be made 5 per cent. or even 10 per cent. on profits; but there should be no royalty payable when the capitalists are receiving no profits. If the Woods and Forests adopted this rule it would quickly be followed by private mineholders.

It has been said already that the "one-fourth clause" protects the capitalist against the middleman who obtains the Crown lease. Let us see how the protection is secured. Take the Cwmheisan-issa-Dolfrwynog again—800*l.* expended on mine; 200*l.* on fees; 25,000*l.* required for working capital. Now, according to the modern system of forming companies, as seen in the Montana, the Lisbon-Berlyn, the Kongsberg, the Spitzkop, and, in fact, all recently-formed enterprises, the practice is not to make the nominal purchase-money equal to 20 per cent. of the working capital, but the working capital 20 per cent. (sometimes 2 per cent.) of the purchase price. On this basis the Cwmheisan-issa-Dolfrwynog would be formed with a capital of 150,000*l.* (instead of 30,000*l.*), and the nominal purchase-money would have to be 125,000*l.* Under this iniquitous system—which simply sacrifices careless and overreaching capitalists in shoals—the "one-fourth clause," now unfortunately abandoned, is the only protection which the *bona fide* shareholder can hope for. As the "one-fourth clause" provided that the Crown lease should not be transferred until after or concurrently with the payment of the one-fourth (in this case 31,250*l.*) to the Government, the formation of such a gigantic bogus concern would have been impracticable. I, therefore, earnestly hope that in all future Crown leases "the one-fourth clause" will be invariably inserted and strictly enforced. In that case I am sure the statement in a prospectus that the property is held under a Crown lease will suffice to command the prompt subscription of the necessary capital, assuming always that the royalty is payable, as in Prussia and elsewhere, upon profits, and not upon produce. The whole system of company promotion has gone radically wrong, and if it could be made criminal for promoters, and immediate vendors to charge more than 50 per cent. or 100 per cent. upon the outlay for labour pay actually made by them—machinery and plant being valued at the true saleable price—it would be to the advantage of promoters and shareholders alike, and mining would enjoy a period of prosperity and high reputation, which would establish it in its true position as the most important of national industries.—*Whitehall, Aug. 5.* NOBOSH.

#### CROWN, AND OTHER CARDIGANSHIRE LEASES.

SIR,—I, with many others, read with pleasure the remarks in the *Mining Journal*, August 2, stating, the Crown has abandoned the "One-fourth Profit Clause," in granting mineral leases, and that they will be prepared to grant leases of the Crown mines on similar terms and conditions as the landowners of this country. This being so, it is satisfactory to find that the principal landlord, Lord Lisburne, has granted his last lease at 1-20th royalty, this being the case at Froncoch, the largest yielding mine in Cardiganshire at present. The Goginan has been granted by both owners at 1-20th royalty, and Mr. Powell, of Nanteos, has expressed his willingness to grant at 1-20th—in fact the only exception of importance is the Gogerddan Estate, which, by refusing to comply with these conditions, must be content to receive one-third of the amount of royalty that would be paid by the mines if worked with spirit. As an instance, South Darren, with rock drills, could and would return 100 tons per month easily, but is only doing 25 tons monthly, whilst others are being kept from working by the endeavour to exact dead rent, as if it is not enough for shareholders to lose their money, but to pay the landlord a premium for doing so. These absurdities must and will soon cease, and then we shall experience what is much wanted, a general revival in mining throughout the country. *Goginan, Aberystwith, Aug. 6.* ABSALOM FRANCIS.

#### GREAT POLGOOTH, AND ITS PROSPECTS.

SIR,—I know the mine, and worked in the mine for many years when it was worked by the Messrs. Taylors and Co. At that time it was managed well by Capt. Paul, Bawden, and Williams; they made the mine pay good dividends. I think during the time it was worked by that company it profited about 180,000*l.* The mine was worked once since by another company, and returned a very great amount of tin. Now, Sir, I wish for parties to see what I know and think about the present working of the mine. I was the first man, about four years ago, that put S. Bennett and J. Hosking on the sett, assisted them in getting out tracings and marking the bearings of the lodes, &c. I also laid down by plan before them for the working of the mine, and I have been informed that they sold the mine to Mr. J. Fell soon after it started to work, but not on the plan I laid out. If so it would have been on the Dividend-list long ago. It started under bad management, and it is still very badly managed, such as will never pay as it is now going on.

I have been watching every movement ever since it went to work, and I find I could have managed the mine for six guineas per month. I could also have brought the mine into profit for one-fourth part of the capital that has already been expended, and could have been sending money up to town instead of pulling money down. At present this mine is managed by men whose chief experience has been gained in china-clay works, instead of being managed by a good practical miner. I do not know the directors, but it is a pity they do not get a good miner to manage it in a different way and manner. Pull down nearly all the gully-traps that have been already erected, and turn their attention to places where there is tin to be found, such as would remunerate the adventurers. Clay-workers are daylight miners; but such a mine as Polgooth will require the energy of a candle-light miner, and such a one that knows where to find the hidden treasure with a small outlay. I am sorry to see that the owners' money has been spent or utilised in such a wasteful manner. Certainly the company has been very good with their pay, but there is room for improvement in management. A

capital of about 3000*l.* would bring it into a dividend state, and to work it on a larger scale, such as at the deep adit level, 500*l.*, in addition to their present monthly cost, would place it on the Dividend-list. From that source alone Polgooth has been a good mine for a very long time, and I hope it will revive again. *Hewas Water, Aug. 4.* E. BAWDEN.

#### SILVER-LEAD MINING IN COMBAMARTIN.

SIR,—It is so long ago since anything was done in silver-lead mining in Combmartin that I suspect many readers of the *Mining Journal* have forgotten the very existence of the place. There has, however, been a really grand discovery made here within the past fortnight, and in totally different ground, too, from where the old mines are, and at least a quarter of a mile from the nearest old level. The discovery was made more by accident than through search, but the one or two practical miners who have seen it agree that it is an important find. Large pieces of solid silver-lead ore have been broken from the back of the lode of splendid appearance, and from the dip and direction of the lode itself; it would be impossible to have much more favourable conditions for working the same.

All that is requisite is a little capital. I firmly believe that 500*l.* would open out the property thoroughly. Another week I may be able to give further particulars. I shall simply give facts—nothing will be overdrawn. Probably many of your readers know almost as much as I do of the high repute Combmartin once enjoyed as a silver-producing locality, and that rich as it was known to be the mines at various times were abandoned and then re-worked from the time of Edward III., and even now not one-half of the parish has been explored.—*Aug. 6.* ARGENT.

#### MINING COMPANIES—CAUSES OF THEIR FAILURE.

SIR,—The mining atmosphere is again cloudy with the report that some mines floated a short time ago with a great flourish of trumpets are nothing but rank failures. With your permission I should like to point out the reasons why so many of these new companies come to grief.—1. London management—This often errs from two different reasons (a) misdirected energy (b) supineness. The former is sometimes induced by the impatience of the shareholders (which is certainly natural enough on their part), and the latter from the fact that the directors do not hold a sufficient number of shares to make them thoroughly interested in operations.—2. Inefficient management at the mines.—3. Utter worthlessness of the property itself.

The first fault is difficult to remedy, while the third cannot be remedied, but, Sir, how often do we not see properties that are free from these faults ruined by the second? Why, Mr. Editor, I am unfortunately a shareholder in a mine that has had within two years two managers whom, for the sake of euphony, I will call a tinker and a tailor, for, knowing them personally I can say a tinker or tailor would have been quite as useful as either, and know quite as much of real practical mining. The consequence is the original capital is all spent, and in vain do the directors appeal for further funds. Of the excellence of this property I am well assured from personal inspection, but it will not carry the burden of a costly London management, nor the ten times heavier burden of an inefficient manager at the mine.—*Marbella, Spain, July 30.* W. MICHELL VIVIAN.

#### AMBULANCE WORK, AND MINING ACCIDENTS.

SIR,—At the International Health Exhibition a conference was recently held on ambulance work in the conference room, when a paper was read by Mr. JOHN FURLEY, Deputy-chairman of the St. John Ambulance Association, "On the Carriage of the Sick and Injured." Sir James Paget, Bart., F.R.S., occupied the chair, and there was a numerous attendance, including Sir Edmund Lechmere, Bart., M.P., Sir Edward Perrett, Bart., Sir Victor Houlton, Baron Mundy from Vienna, Dr. Billings, Director-General of the United States Army; the Director of the Army Medical Department, Dr. Farquharson, M.P., Surgeon-General Mackinnon, C.B., Captain Perrett, Surgeon-Major Hutton, &c.

In speaking of the subject of the careful carriage of the sick and injured, Surgeon-Major Hutton referred at some length to accidents in the mining districts. He said—In the limited time allowed in these meetings for discussion, I can only select one subject for comment, among many relating to the subject of the sick and injured. This one, however, is very important, as it has close connection with the national health and the national wealth. I would refer you to the numerous accidents that are continually occurring among our large mining population—our colliers and iron workers. By way of example, I would first refer to an individual case. A man, a skilled artisan, has his leg broken in one of our large ironworks in the Midland Counties. Let me read to you an account of the accident as given to me in a letter from the doctor in attendance. "The man was hurt in the beginning of February—his injury was a simple fracture of the leg, and carrying him home the fracture was complicated by a serious displacement of the foot, which has acted so seriously that a limb which would have been well in three months will take at least seven months before it is quite sound." You see, then, the unfortunate result of want of system, care, and skill in the removal of an injured man—fully 16 weeks more, in this case, of enforced idleness from lack of timely first aid and careful removal, in the manner recommended by Mr. Furley and the St. John Ambulance Association. Now, this man was in the receipt of 30*s.* a week, and of course during the whole period of sickness this has been lost, but that is not all; he has been receiving from the Employers' Liability Assurance 10*s.* a week, and another 5*s.* from the sick club, making a total loss of 25*s.* a week.

The question arises (continued the speaker), can we sum up this loss as dead loss, for, of course, the sick requests replace the wages as the family's expenditure, but then the man's productive labour is lost to the amount of his own wages, and his employer's profits also; unless, having taken on another man who was out of work, then we must cancel the 20*s.* as being dead loss to the sufferer only, and not to the productive labour of the community. If so, you must subtract the money he receives from his wages, and say he loses 15*s.* a week, and the club 10*s.* a week more. It seems to me an important calculation, and I should like, when opportunity affords me, to take the opinion of some expert on questions of social economy on this case. It must be evident, however, to everyone here, that the loss to this man and his family is very great. The money he receives per week for the support of himself and family is reduced from 30*s.* to 15*s.* a week, and that means less food, less clothing, less of the actual necessities of life, and, therefore, less health for his family. Now, this is one of many thousands of cases that take place every year among our great mining and industrial classes. Let me instance a private engineering and manufacturing firm, employing, perhaps, the highest skilled labour in the country. I find that in one year (1883) their accident compensation fund had paid 1306*l.* 8*s.* 1*d.* for injuries received by workmen—214 claims had been admitted, and the sums awarded varied from 2*s.* 3*d.* to 200*l.* This firm has during the last winter introduced proper ambulance material, and a large number of their men have been instructed in using it, and in a letter I have recently received from the secretary of the accident fund, he states, "when preparing the report of the ambulance classes, I called the attention of the committee to the remarkable diminution in the number of cases coming forward for compensation." Carry this enquiry still further, to a district—the great iron mining district of Cleveland and North Yorkshire.

From returns that have been furnished me (Surgeon-Major Hutton) by the secretary of the Miners' Association for the year ending Dec. 31, 1883, the total number of accidents reported were 847 non-fatal and 29 fatal. This report states—"If we made a very moderate calculation in relation to the accidents which have not been reported we arrive at the startling fact that one person has been injured or killed during 1883 for every eight employed in and about the Cleveland mines." Some of the non-fatal accidents have been of a very serious character, laying off work the sufferers for weeks and months, and I am sure a perusal of these returns convey, with terrible distinctness an idea of the dangerous nature of the miners' work. I cannot give a correct account of the time lost in all these cases; but in another report of a small cottage hospital in this district—the Guls-

borough Miners' Accident Hospital—75 injured men have been treated during the same year (1883). Many of these were serious fractures, and the combined time these cases were in hospital amounted to 750 days, or upwards of two years' employment. That did not mean all the loss, for many of these poor fellows after they left the hospital had not regained sufficient strength to resume work for some time, so serious had been the nature of their injuries. If we extend our enquiries to the coal and iron mining districts generally throughout the country, you will find that there are some 560,000 men and boys employed, and one relief society alone in one year assisted 14,328 injured cases, and last year (1883) out of a total membership of 224,000 belonging to the various societies in our mining centres, no less than 44,579 cases of injuries were relieved. Lord Crawford and Balcarres, a high authority on these matters, stated at an ambulance meeting at Wigan some time ago there could be no doubt that as many as 100,000 accidents, large and small, occurred throughout the mining districts of this country in one year.

Surely, with facts like these before us—so much pain and suffering to alleviate—there is abundance of good work to be done by proper means of carriage for the injured, as brought to our notice by Mr. Furley. It must be obvious to everyone, from the facts and figures I have quoted, that this subject is one largely affecting the national health and the national wealth; and especially the health and well-being of a class of men whose toil and whose labour contribute so much to the comfort and wealth of the nation. I believe it would afford much pleasure to His Royal Highness the Prince of Wales to know that this exhibition had been the means of assisting in promoting work calculated to relieve pain and suffering among our mining population by assisting in the introduction of well-regulated means for the carriage of the injured everywhere among our collieries and ironworks. I would ask, then, everyone here to examine for themselves the ambulance exhibits, and to exert their influence to foster and extend this good work. I would particularly urge upon the owners of royalties in mines that they should largely contribute, and unite with those who work the mines to provide proper ambulance material for the mining districts. I hope the day is not far distant when this work of the St. John Ambulance Association—the safe carriage of the sick and injured—will take the same place in the hearts of the people of this country as that other noble work which has done so much during the past 60 years to save life and relieve suffering on our stormy coasts—the work of our Royal National Life Boat Institution. I would ask you all to assist Mr. Furley and the St. John Ambulance Association in making more widely known this humane and Christian work, for in reality it is—if the public were made aware of it—a national life brigade upon the land.—*Leamington, Aug. 2.* PHILLO.

#### FOREIGN MINING AND METALLURGY.

The situation appears to be becoming worse in France. One of the industrialists of the Nord has separated himself from the group, and as his production amounts to from 12,000 tons to 15,000 tons annually it appears probable that, notwithstanding all the efforts of producers, prices will not be supported at the fictitious level at which it has been sought to maintain them. It is stated that transactions have been recently concluded at 5*l.* 4*s.* per ton at the forges. Such a low price is stated to have been never previously recorded in France. Merchants' iron has continued to be nominally maintained at Paris at 6*l.* 8*s.* per ton, while plates have made 8*l.* per ton, but it appears tolerably plain that lower rates could be enforced. All descriptions of metallurgical products appear to be tending downwards in France. There are continued rumours of an approaching adjudication of 100,000 tons of rails in France. There is no important intelligence to communicate with respect to the German iron trade. It may be observed, however, that at a recent adjudication of tyres the lowest tenders were submitted by two Belgian works—the Baume and Haine Saint Pierre Companies. The German steelworks are generally well employed.

Few changes have occurred in the general tone of the Belgian Iron Trade. There is a sufficient current of business to maintain employment at about its ordinary level, but not sufficient to secure any improvement in quotations. On the contrary, holders of iron appear disposed to make concessions in the higher numbers rather than otherwise; and, as regards plates, they are also disposed to adopt a similar policy. Upon the whole, however, it cannot be said that prices have experienced any material change. English casting pig has remained at about 2*l.* 2*s.* 6*d.* per ton upon the Belgian market. Belgian hard refining pig has made 2*l.* per ton, while ordinary pig has brought 1*l.* 16*s.* per ton, and mixed pig 1*l.* 12*s.* per ton. Iron has experienced no important change in Belgium. No. 1 has made 4*l.* 10*s.* per ton for export, and 4*l.* 12*s.* per ton on home account; while No. 3 has been quoted at 4*l.* 16*s.* per ton, and No. 3 at 5*l.* 2*s.* per ton. Girders have remained at 4*l.* 16*s.* to 5*l.* per ton. Plates have continued to be quoted at their former prices, No. 2 making 6*l.* 4*s.* per ton, No. 3, 7*l.* per ton, and plates of commerce 8*l.* 12*s.* per ton. The Central Belgian Rolling Mills at La Louvière, subsequently known as the Rolling Mills of the Centre, have been reconstituted a third time under the title of the La Louvière Plate Mills Company, with a capital of 12,000*l.*

There have been few changes in the Belgian Coal Trade, which remains upon the whole in a favourable condition, having regard to the season of the year, and the weak state of metallurgical affairs. Except as regards coking coal and coke Belgian colliery proprietors are not complaining very much. Prices have remained at about their former level. In the Liège basin business appears to be established upon a tolerably stable basis. The number of trucks carrying coal and coke which passed over the Belgian State Railways in the week ending July 27 was 15,662, as compared with 17,323 in the corresponding seven days of 1883, showing a decrease of 1667 this year. It appears from a French official return that there were 300 collieries in activity in France in 1882, of which 191 were worked at a profit during the year, while 117 were worked at a loss. The aggregate production of the 308 mines in 1882 was 20,618,000 tons, the market value of which was estimated at 9,400,000*l.* The German coal markets have shown rather a weaker tone during the last few days than they have exhibited for some time past. The principal German railway companies have laid in heavy supplies, and the exports, especially those to Holland, have shown a tendency to diminish. The movement of German coal to Italy has also been falling off of late. The whole exports of coal from Germany in the first five months of this year are officially returned at 3,448,980 tons, as compared with 3,327,017 tons in the corresponding period of 1883.

CANADIAN MINING.—It is proposed, says the *Liverpool Journal* of Commerce, to establish a mining bureau at Fort Arthur for the purpose of disseminating information regarding the mines. Silver islet, after yielding millions, has collapsed, but the Rabbit Mountain, Huronian, and other mines are in full blast. Explorers say, too, that there are rich deposits on the shore east of Fort Arthur, including silver, iron, baryta, and zinc blende. The sandstone discovered at Vert Island is being used in the construction of the Nepigon Bridge Pier. Mr. J. H. Panton has gone on a trip to Lake Winnipeg to examine the rock exposures along the shore. He will make his headquarters at Dog's Head, and explore the coast in a canoe. His visit will, no doubt, throw a good deal of light on the geology of the district, and a paper on the results of his research will be read before the Historical Society of Winnipeg on his return.

THE FACTORY NEWS.—The Exhibition Number in English of the curious little Dutch weekly periodical published in Delft by the Netherlands Yeast and Spirit Manufactory is well worthy of perusal. It is edited by the manager of the factory, and distributed gratis among the employees and workmen, by whom it is perused with constantly increasing interest. It refers to the social and domestic affairs of the society only, and never touches any political or religious subject. In the "Deaths, Births, and Marriages" we find "Births, June 29:—Sophia Maria, daughter of J. C. Weezenburg, driver, and A. J. M. van den Boogert. Deaths, June 28:—Jacobus, three years, son of J. Toorenburg, yeast packer," and similar little items of purely internal interest referring to the laying out and cultivation of the gardens are given. The *Factory News* is in many respects worthy of imitation.



# MINING IN DERBYSHIRE UNDER THE DERBYSHIRE MINING CUSTOMS AND MINERAL COURTS ACT OF 1852.—No. I. By W. NINNESS, M.E.

In 1851 and 1852 respectively two Acts of Parliament were passed confirming or making law customs, the former relating to the working of minerals within the king's field, and certain parts of the Hundred of the High Peak, in the county of Derby; the latter having relation to the soke and wapentake of Wirksworth, and of the manors or liberties of Crich, Ashford, Stoney Middleton, and Eyam, Hartington, Litton, Peak Forest, Tideswell, and Yougholme, also in the county of Derby, districts teeming with mineral wealth. The Act of 1852 nearly assimilates with that of 1851, and it is the former that I intend in coming articles to treat upon, and briefly pourtray the advantages the miner has in Derbyshire in working and searching for minerals. It has been said of the Act in question that it gives the miner dangerous power, and the same authority asserts that the protection of the rights of property should always be paramount to local privileges. However this may be, so far as the interests of the miner are concerned, it is not necessary to discuss the point. It has been proved repeatedly that the same question discussed from a landowner's point of view and that of the miners differs essentially, otherwise necessary changes would have taken place, and the English miner would at the present have more breathing room. In this case the above-named Act of Parliament gives the miner, so to speak, unlimited power in the districts to which it applies, in the pursuit of his industry. To wit—the first article of the Act confers a power upon all the subjects of this realm to search for, sink, and dig mines of veins of lead ore upon, in, or under all manner of lands, of whose inheritance they may be (churches, churchyards, places of public worship, burial grounds, dwelling-houses, orchards, gardens, pleasure grounds, and highways excepted); and by a subsequent part of the same article may conditionally follow a vein even under the excepted places. Again, by the fourth article, the baron and two of the grand jury (who must be miners) may provide the miners a way either for foot passengers or carts as may be required from the highway lying most convenient to the mine, and also from the mine to the nearest running stream of water, not being ornamental water or private fishery, for which way the occupier or landlord of the land over which it passes cannot claim any compensation. Again, by the fifth article, every miner shall, so long as his mine shall be worked, be entitled, without making any payment for the same, to the exclusive use of so much surface land as shall be thought necessary by the baron and two of the grand jury, and to be set out by them from time to time for the purpose of laying rubbish, dressing his ore, puddling, making meres or ponds, and conveying water thereto, and any other mining purposes. In return for the concession on the part of the landowners of these important privileges, he (the landowner) has power to sell and dispose of calk (carbonate of zinc), feng (gravel), spar, and other minerals and rubbish (except lead ore), and to remove the same from his land, so soon as the lead ore has been extracted from it, when and as often as he thinks proper, and when not required for the use of the mine, but not so as to destroy or injure any mineral property without the consent of the baron and two members of the grand jury. Notwithstanding this power on the part of the landowner, with the exception of the dues the miner under the jurisdiction of the Act can boast of rights and privileges which he cannot obtain in any other country. The Act of Parliament in question, investing the miner as it does with such power over the landowner, has hitherto not unnaturally contained seeds for discussion and litigation, several important trials, arising therefrom, and until the termination of the long and heavy trial of Wake Hall last year, fears were entertained by miners and investors within the jurisdiction of the Act that its provisions would be repealed, and that the rights and privileges which have descended to the miner from the time of Henry II. might be set aside. Fortunately the trial culminated in favour of the miner, and as stated in an article in the *Mining Journal* of March 31, 1883, under heading "The Lead Mining Customs of Derbyshire, &c.," giving a succinct account of the trial. "By the judgement just given the ancient customs of the lead districts known as the King's Field have been determined to be impeachable, having all the force of statute law, and that by the highest courts in the Kingdom."

The rights and privileges of the mines in Derbyshire, the present position and prospects of the lead market, I consider offer excellent facilities to the investor, as valuable properties can be obtained without paying a penny promotion-money, and, in fact, nothing beyond the Act of Parliament before-named, which amounts in all to a few shillings. The natural advantages offered in working on many of these properties, i.e., by water-power, and their excellent situation for railway and other accommodation cannot be excelled in this country.

## ELECTRIC BLASTING AND LIGHTING AT LLANWDDYN QUARRIES.—No. I.

Amongst the largest engineering works at present in course of construction are, says the Engineer, those undertaken by the City of Liverpool for the supply of that city with water. Away up amongst the Welsh hills, some 70 miles from Liverpool, what was once a fertile agricultural valley is being rapidly converted into a lake by the process of building a masonry dam across its narrow lower end, thus backing up and impounding the waters of the River Vyrnwy, over the village and valley of Llanwddyn. The area of the lake when formed will be 1115 acres, with a length of 4½ miles, and will contain nearly 11,000,000,000 gallons above the level at which the water will be drawn off for the supply of the City of Liverpool. The engineers of this great work are Mr. T. Hawksley, C.E., of Westminster, and Mr. G. F. Deacon, C.E., of Liverpool. It is not, however, with the construction of the embankment and the lake that it is proposed to deal in this article, but rather with the scientific appliances used in the quarrying of the stone from the wall. The quarries in question are situated about 1 mile away from the site of the masonry dam, with which they are connected by a double line of narrow gauge (3 ft.) railway, somewhat remarkable in itself for its uniform gradient of 1 in 30, and for two or three very sharp curves, one of which possesses the somewhat unenviable radius of 150 ft. Geologically speaking, the quarries are in the massive beds of rock at the base of the Bala or Caradoc beds of the lower Silurian group, which dip at an angle of about 30° to the west. The position is very favourable for quarrying, and the beds are stripped off one by one, each layer being from 6 ft. to 10 ft. thick, but divided into beds of about 3 ft. The blocks come out, with skillful quarrying, in their natural crystallised form as rhomboids. The locating, development, and control of these quarries was entrusted by the Corporation to a firm of mining engineers well known in North Wales and its borders—Messrs. D. C. Davies and Sons, of Oswestry—and at the time of our visit there were some 600 men employed by the Corporation under them, the works continuing uninterruptedly day and night. The output at that time was over 300 tons of building stone per day, mostly dressed, to say nothing of the removal of waste and the extension of the quarry. In order to grapple with so large an output all the appliances of machinery and science which were thought of practical value have been brought into successful work.

To the student of either mining or civil engineering no better opportunity could be afforded than by a visit to these works of seeing in daily practical use the various engineering appliances, with which in their application and the manner in which they are utilised as so to be of daily and increasing value, he is absolutely ignorant. The beds of rock lie, it may be added, in a way which peculiarly adapts itself to electric blasting, and this has been adopted to the almost total exclusion of the ordinary methods by means of a fuse, which is only used in isolated and special cases. At first the Welsh quarrymen and foremen were much prejudiced against its employment, and used every means to discourage its introduction, almost disheartening the young engineer to whose control it was entrusted, necessitating his personal superintendence at the charging of every hole and the making of every joint. A man and a boy have now been trained, and are almost constantly employed in preparing the fuses and firing the

shots. The battery employed for firing is one of Siemens' high tension, and resembles when open a small dynamo, being driven by a handle and train of wheels, and to which is attached a condenser, consisting of alternate layers of mica and tinfoil. The electricity stored in the condenser is automatically discharged at every third turn of the handle of the machine, and passing along the wires and through the fuses, fires the holes simultaneously. As many as 50 holes could be fired at once, but in practice it was not found advisable to couple more than 30 together, owing to the difficulty of insulating so many, and the consequent short-circuiting of some of the holes, thus spoiling the blast and necessitating their subsequent firing. The holes as a rule are 9 ft. deep, 1½ in. diameter, 3 ft. apart, and placed at a distance of 9 ft. from the edge of the rock. The men stand on a line of planks along the slope when preparing holes for a blast. Thirty of these holes would bring down a mass of 576 tons of rock, in blocks from 3 to 5 and 10 tons, those from 3 to 7 tons being the most useful, as if they are over 7 tons the cranes used in building are unable to lift them. A great deal of waste is occasioned by breaking up large stones, as one of 8 tons cannot be broken into two good stones of 4 tons, and sometimes the effort to do so is simply wasted. In order to prevent as far as possible this waste, owing to the blocks being too large, much judgment and experience are necessary in choosing the best site for the holes, and after many trials the above dimensions were adopted as affording the best average results.

## VENEZUELAN MINING AND INDUSTRIAL PROGRESS.

Some time since an attempt was made in London to raise money for the Alianza de Cicapra Gold Mining Company, but so little had been done and the loading of the capital was so excessive, as to render the earning of profits improbable if not impossible, the scheme proved abortive. The original Venezuelan concern had a nominal capital of 135,000*l.*, little of which, however, could have been expended upon the property, as there were only the usual mine buildings, a 30 stamps mill, with additional boiler power for 30 more stamps, and two small shafts had been sunk. Europeans were asked, virtually, to pay 445,000*l.* for the work done, and to provide 35,000*l.* working capital on condition of the Venezuelans finding 15,000*l.* working capital; and this 50,000*l.* working capital was to earn dividends on 495,000*l.* Of the unproductive or imaginary capital the Venezuelans were to receive 300,000*l.* in shares and 35,000*l.* in debentures—335,000*l.*; and the London syndicate were to receive 100,000*l.* in shares and 10,000*l.* in debentures—110,000*l.*, together 445,000*l.* It appears from Messrs. De Rojas Brothers' August Circular—Anglo-Venezuelan Review—that some French promoters have been found bold enough to attempt to raise the 50,000*l.* on ordinary shares, though the English would not lend it on 20 per cent. first mortgage debentures, so that no debentures will be created. Under the French scheme, each 1*l.* of working capital will have to earn dividends upon 8*l.* of share capital. If the French be willing to lend money upon such suicidal terms, France will no doubt prove an attractive field not only for Venezuelan exploiters but for those from all countries where mining property is obtainable on nominal terms. It is proposed that Mr. Charles Oxland, M.E., should take the superintendence of the works, but neither he nor anyone else could the property return appreciable profits when so heavily loaded.

With regard to general intelligence Messrs. De Rojas Bros. state that on June 7 the new President of Venezuela granted a concession for the construction of a harbour at La Guayra, which will supersede the dangerous and inconvenient accommodation now found in the roads. To carry out this important work it is intended to prolong each side of the present existing wharf by adding a breakwater or a jetty to each side, and a narrow gauge railway will be constructed for the conveyance of passengers and goods to the Custom House at the La Guayra Railway Station. By this concession it is agreed that all the materials required for the construction and maintenance of the works shall be free of all national duties for a term of 99 years, after which period the whole of the property will revert to the nation. As a result of the proposed construction some land will be reclaimed from the sea, and this will belong to the company. The company is also authorised to take possession within a space of 200 metres east or west of their wharf, of any warehouses or buildings required by them as depôts or offices, purchasing them at the same legal valuation as if they were destined for public use. The company have accorded to them the right to take and use, free of cost, stone, sand, and earth found in any of the public parts of the port.

It has been calculated that this undertaking will cost 320,000*l.*, and the Government guarantees for 25 years interest on this sum at 6 per cent. per annum. The company will charge 1*s.* 7*d.* for every 100 kos. of dry goods landed at the wharf and carried to the Custom House, or vice versa; 1*s.* 2*d.* for every 100 kos. of articles of food, produce, &c.; 1*s.* 7*d.* for every 100 kos. of luggage; and 10*d.* for each passenger on embarking or disembarking. National and foreign vessels will pay as port and light dues to the enterprise—Steamers, 1*l.* 12*s.*; rigged vessels, 1*l.* 4*s.*; schooners, 16*s.*; smaller vessels, 8*s.* In view of the traffic existing at La Guayra we calculate that the revenue which the company will derive from the above tariff will permit the payment of a dividend of 12 per cent. on a capital of 500,000*l.*

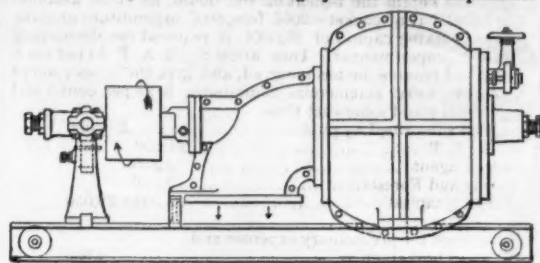
The La Guayra and Caracas Railway, during four weeks (June 2 to June 30), has yielded the following returns:—Passengers, 36,408-00 bol.; parcels and luggage, 2312-10 bol.; goods, 128,686-06 bol.; storage, 650-68 bol.; total, 168,056-84 bol., or 6722*l.* 6*s.*

A decree, dated June 5, has authorised the Venezuelan Minister in Europe to coin 200,000*l.* or 5,000,000 bolivares of the national currency, according to the Venezuelan law on the subject. Half of the sum will be coined in gold and the remainder in silver; the monthly remittances to Venezuela are not to be less than 20,000*l.* The Minister is authorised to have this sum coined at the mint in Europe which he may deem most expedient. The dies are already in existence, and were used in the last Venezuelan coinages carried out in France and Belgium.

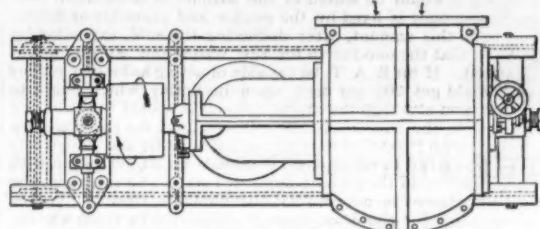
**COPPER.**—Messrs. RICHARDSON and Co. (Aug. 1) write: The stocks of copper remaining unsold at Swansea on July 1 was:—Ore, 127 tons; regulus, 2323 tons; copper, 3527 tons. The present stocks are:—Chill ore, 323 tons; regulus, 2242 tons; copper, 4155 tons. Cape ore, 743 tons. Quebrada ore, 3536 tons. Portuguese ore, 857 tons. Spanish ore, 610 tons; precipitate, 180 tons. Cuban precipitate, 31 tons. Australian ore, 19 tons. British ore, 12 tons. Total unsold at Swansea:—Ore, 6100 tons; regulus, 2242 tons; copper, 4155 tons; precipitate, 211 tons. Equivalent to about 6040 tons of fine copper. The private sales during the past month comprise:—Cape ore, 150 tons at 11*s.* per unit; Quebrada, 730 tons Ruby ore and 690 tons regulus at 10*s.*; Bolivian regulus, 315 tons at 10*s.* 9*d.*; Chile regulus, 1710 tons at 10*s.* 6*d.*; Cueva de la Mora precipitate, 130 tons at 11*s.* and 618 tons at 10*s.* 6*d.*; Aparis copper ore, 40 tons at 10*s.* 6*d.*; Libiola ore, 50 tons at 10*s.* and 2118 tons at 9*s.* 9*d.*; Spanish ore, 122 tons at 10*s.*; Namagua, 250 tons at 10*s.* The market during the past month has suffered great depression, bars having fallen to 53*l.* 10*s.*—some holders of furnace material decided on meeting the market and accepting the prices shown in above sales. During the present week bars have somewhat improved, and there is now a better demand for furnace material. Chill charters for second fortnight of June were advised as 300 tons fine—300 tons bars and ingots, and 100 tons regulus for England, and 500 tons for Continent. For first half of July, 3200 tons fine—1100 tons bars and ingots and 1200 tons in furnace material for England, and 900 tons bars for Continent.

## HETT'S MINING TURBINE.

There is an increasing demand for turbines and machinery suitable to cope with the difficulties of transport involved in reaching the sites of mines, after arriving at the port of disembarkation, especially where mule transport has to be resorted to. In the latter case each package of machinery is restricted to a certain weight to allow of its being carried on the backs of these useful animals, the transporting of the machinery in some cases being by other means impossible.



Scale about ¼ inch to the foot.



12-inch Patent Mining Wheel, constructed for Mule Transport.

To meet this demand with regard to turbines we publish an illustration of one recently constructed by Mr. HETT, of the Anchole Ironworks, Brigg, for export to South America, through a well-known mining machinery engineer. It will be observed that the turbine is of the horizontal type, which Mr. Hett has introduced for medium falls of water. For convenience in fixing this class of wheel surpasses all others. Very little foundation is required, sometimes the beams carrying the turbine being simply built into the walls of the building. The power can be taken off the turbine and transmitted to the machinery or line shafting to be driven without the aid of intermediate gearing, thus dispensing with a heavy item both in first cost of machinery and in freight, as well as a considerable saving in wear and tear. The main features of the turbine may be summed up as follows:—The runner is of the improved "Pent" type, mounted on a steel shaft which projects through the curved draft tube, and carries the pulley. Each end of the shaft is provided with screw adjustment to compensate for wear. The pulley end is carried by an improved adjustable bridge bearing, specially constructed for export purposes, which readily adapts itself to any inequality which may arise in the setting of the turbine. The cast-iron case is spherical, divided into eight sections, and bolted together. It is provided with a cover fitted with a sleeve for carrying the end of the shaft, a lignum vitae gird intervenes between the shaft end and the adjusting screw, the sleeve inside the case is also bushed with lignum vitae, and is water-lubricated. A curved draft tube is attached to the other side of the case, and leads away the water after passing the wheel.

When the turbine is placed just above the tail water a short piece is connected to the draft tube which dips into it. The turbine can, when required for convenience in driving, be placed at an elevation above the tail water, the pipes attached to the draft tube being lengthened to suit. To ensure the best results the end of the draft tube must always dip some 3 or 4 in. into the tail water, so that every inch of fall is utilised. The regulation of the water to the turbine is accomplished by a worm arrangement worked by the hand wheel as shown; by this means the gates can be manipulated with the greatest ease, and can be retained in any position to suit the speed and power required, as well as to effect the greatest economy when the water is scarce. Mr. Hett's wheels are constructed specially for the economical use of water at part gate, and every care is taken in turning out a first-class article.

## THE COAL TRADE.

Mr. J. B. SCOTT, the Registrar of the London Coal Market, has published the following statistics of imports and exports of coals into and from the port and district of London by sea, railway, and canal during July, 1884:—

IMPORTS.			EXPORTS.		
By Sea.	Ships.	Tons.	By Railway and Canal.	Tons.	cwt.
Newcastle	137	135,224	London & N. Western	122,477	13
Sunderland	71	51,846	Great Northern	100,971	0
Seaham	49	39,618	Great Western	73,546	0
Hartlepool	36	14,594	Midland	171,958	9
Middlesbrough	1	268	Great Eastern	65,027	3
Scotch	6	2,608	South-Western	5,572	16
Welsh	34	33,483	South-Eastern	1,499	18
Yorkshire	29	8,549	Grand Junction Canal	1,089	0
Small coal, cinders	23	12,791			
Colonial	1	90			
Total	389	290,571	Total	541,801	10
Imports—July, 1883	371	269,181	Imports—July, 1883	597,857	19

COMPARATIVE STATEMENT, 1883 AND 1884.			COMPARATIVE STATEMENT, 1883 AND 1884.		
By Sea.	Ships.	Tons.	By Railway and Canal.	Tons.	cwt.
Jan. 1 to July 31, 1884	2997	2,309,072	Jan. 1 to July 31, 1883	3,817,722	19
Jan. 1 to July 31, 1883	2811	2,201,530	Jan. 1 to July 31, 1884	3,826,935	18
Increase—1884	186	107,542	Decrease—1884	90,787	1

EXPORTS.			COMPARATIVE STATEMENT, 1883 AND 1884.		
Railway-borne coal passing "in transitu" through district.	Tons	cwt.	Total distribution of coal from Jan. 1 to July 31, 1884	1,751,836	
Sea-borne coal exported to British possessions, or to foreign parts, or to the coast	98,778		Total distribution of coal from Jan. 1 to July 31, 1883	1,635,887	
Ditto sent beyond limits by railway	14,654				
Ditto by canal and inland navigation	1,225	114,587			
Railway-borne coal exported to British possessions, or to foreign parts, or to the coast	29,505				
Ditto by rail beyond district	363	29,868			
Ditto by canal and inland navigation	416				
Sea-borne coal brought into port and exported in same ships	242,366				
Total quantity of coal conveyed beyond limits of coal duty district during July, 1884	242,366				
Ditto, during July, 1883	242,549				

General Statement, 1883 and 1884.			General Statement, 1883 and 1884.		
Increase in the present year	115,949		Increase in coals exported during present year	115,949	
Increase in coals imported (sea-borne)	107,542		Deduct { Increase in coals imported (sea-borne)	107,542	
Less decrease in coals imported (railway and canal)	90,787	16,755			
Total decrease in trade within the London district during present year	99,194				

# MANCHESTER WIRE WORKS.

NEAR VICTORIA STATION, MANCHESTER.

(ESTABLISHED 1790).

## JOHN STANIAR AND CO.,

Manufacturers by STEAM POWER of all kinds of Wire Web, EXTRA TREBLE STRONG for

LEAD AND COPPER MINES.

Jigger Bottoms and Cylinder Covers woven ANY WIDTH, in Iron, Steel, Brass, or Copper.

EXTRA STRONG PERFORATED ZINC AND COPPER RIDDLES AND SIEVES.

PERFORATED IRON, STEEL, COPPER, AND ZINC PLATES IN VARIOUS DIMENSIONS AND THICKNESSES,  
Shipping Orders Executed with the Greatest Dispatch.





## THE PULSOMETER PATENT STEAM PUMP,

Very largely adopted in Mines  
and Collieries.

### ADVANTAGES.

WILL WORK SUSPENDED ON A CHAIN.  
WILL PUMP THICK SANDY WATER FREELY.  
NO EXHAUST STEAM.  
NO SKILLED ATTENTION REQUIRED.

The Pulsometer is especially suitable for sinking  
shallow shafts, pumping out flooded galleries (see  
illustration), COAL WASHING, &c., &c.

**Direct-acting Pumping  
Machinery for High Lifts  
in Mines.**

FULL PARTICULARS AND ILLUSTRATIONS ON RECEIPT OF PARTICULARS OF REQUIREMENTS.  
**THE PULSOMETER ENGINEERING COMPANY (LIMITED), NINE  
ELMS IRONWORKS, LONDON, S.W.**

CITY OFFICE AND SHOW ROOM—61 AND 63, QUEEN VICTORIA STREET, E.C.

Light Wrought-iron Pipe for Sinking Work—Steam Hose—Pulsometers on Hire by Special Arrangement—Centrifugal Pumps—  
Three-throw Pumps, &c., &c.

## SYBRY, SEARLS, & CO.,

MANUFACTURERS OF THE

**CELEBRATED MINING STEEL,**

BRANDED



## CRUCIBLE STEEL CASTINGS

Of Special Toughness, Strength, and Durability.

**SPECIAL ROCK DRILL STEEL,**  
Tool Steel, Shear, Blister, Spring, Files, Hammers, Picks, &c.

**CANNON STEEL WORKS, SHEFFIELD.**

## SAMUEL OSBORN AND CO.,

MANUFACTURERS OF TOUGHENED

## CRUCIBLE STEEL CASTINGS

Of all descriptions of special strength and solidity.

ALSO, MANUFACTURERS OF

BEST CAST STEEL FOR ENGINEERS AND MINERS' PURPOSES; FILES; SAWS; HAMMERS; RAILWAY SPRINGS, &c.  
STEEL SHEETS AND FORGINGS.

SOLE MAKERS OF

**R. MUSHET'S CELEBRATED EXTRA BEST  
TITANIC CAST STEEL FOR BORERS**

And of R. Mushet's special Steel for Lathe and Planing Tools and Drills,  
THE STEEL WHICH REQUIRES NO HARDENING.

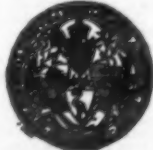
**CLYDE STEEL AND IRON WORKS, SHEFFIELD.**

## BAXTER'S PATENT KNAPPING STONE BREAKER.

THE LAST FOUR MEDALS AWARDED FOR STONE BREAKERS,



1881.



1881.



FACTS SPEAK FOR  
THEMSELVES.



Our Machine, tested by the Judges  
Calcutta, broke 7 tons in 45 minutes to  
24 in. ring, and was awarded First Class  
Certificate and Gold Medal in competition  
with the Blake Machine.

The ONLY MACHINE which has never failed to do what it was  
guaranteed, and is also the ONLY MACHINE which has never had  
a driving shaft broken or the end sent out.

crushed at Shrewsbury Royal Show, Stand No. 247, in July, either  
by our Breaker or New Patent Fine Crusher.

We also exhibit at the Highland Show at Edinburgh in July.

PATENTEES AND SOLE MAKERS—

**W. H. BAXTER & CO., ALBION STREET, LEEDS.**

## ALEX. WILSON & CO VAUXHALL IRONWORKS, LONDON, S.W.,

MANUFACTURERS OF

THE VAUXHALL DONKEY PUMPS

THE EXCELSIOR DIRECT-ACTING  
PUMPS.

**Air Compressors.**

**Winding Engines.**

**HOISTING MACHINERY.**



ILLUSTRATED AND PRICED CATALOGUES ON APPLICATION

## MACDERMOTT AND GLOVER'S PATENT PERCUSSIVE ROCK PERFORATOR (IMPROVED)

FOR HAND-LABOUR ONLY

**IN HARD ROCK**

FOR MINES, QUARRIES, AND

GOVERNMENT CONTRACT WORK

RATE OF PENETRATION

IN GRANITE,

1½ to 2 inches per minute.

Price £50 complete.

For full particulars, apply to

**GLOVER & HOBSON**

ENGINEERS & MILLWRIGHTS

ALBERT IRONWORKS, ST. JAMES'S ROAD, OLD KILN

ROAD, LONDON, S.E.,

SOLE MANUFACTURERS; OR TO—

**M. MACDERMOTT, 25 and 26, Pudding Lane, London**

N.B.—A machine can always be seen at work (without notice) at the

Ironworks. [TELEPHONE 4654.]

INCREASED VALUE OF WATER-POWER

## MacADAM'S VARIABLE TURBINE

This Wheel (which is now largely in use in England, Scotland, and Ireland) is the only one yet invented which gives proportionate power from both large and small quantities of water. It can be made for using a large winter supply, yet work with equal efficiency through all variations of quantity down to a very small or even less if required. It is easily coupled to a steam-engine, and in this way always assists it by whatever amount of power the water is capable of giving, and therefore saves so much fuel.

This Turbine is applicable to all heights of fall. It works immersed in the water, so that no part of the fall is lost, and the motion of the Wheel is unaffected by floods or back-water.

These Turbines are at work in nearly every county in England. Apply to

**MacADAM BROTHERS AND CO  
BELFAST.**

## RAILS—STEEL AND IRON.

NEW, PERFECT, and SLIGHTLY DEFECTIVE. Suitable for Colliery Sidings and Contractors' purposes. Large and small stocks.—Apply for Sheet of Sections to

**BOLLING AND LOWE,**

2, LAURENCE POUNTNEY HILL, LONDON, E.C.

## CALIFORNIAN AND EUROPEAN AGENCY.

509, MONTGOMERY STREET, SAN FRANCISCO CAL.

J. JACKSON, Manager.

## COMPOUND DIVISION COST SHEET READY RECKONER

Designed for effecting in minutes what has hitherto taken hours to accomplish.

For use in making out Cost Sheets of Collieries, Ironstone and other Mines, Iron, Gas, and Water Works, Quarries, and Manufactories generally. For Accountants, Merchants, Public, and Private Offices.

By WILLIAM WETHERED.  
This work is applicable to calculations where any number of articles are given sum, and the price of one of such number is required. The circulation of such a book as this must necessarily be limited. It is doubtful whether it will pay more than the bare cost of publishing, although nothing for the enormous amount of labour such a mass of figures has cost. The price cannot be named at less than 25s., and it is not too much to say where it can be applied its cost will be saved in a few weeks. It will be invaluable to accountants generally. Copies can now be had, and will be forwarded from the MINING JOURNAL on receipt of Post Office Order for the amount.

## TABLES FOR ASCERTAINING THE PRICE OF THE

AT A GIVEN STANDARD AND PRODUCE:

To which is added Tables for Ascertaining the Value of any Quantity of Black Tin, from 1 lb. to 10 tons, at any price from £20 to £100 per ton. Originally compiled and calculated by the late Mr. R. WELLINGTON, and extended, reprinted by Mr. W. BAILEY, of Camborne, and carefully revised throughout.

London: MINING JOURNAL Office, 26, Fleet-street, E.C.; and may be had by order of all Booksellers.

Australia: GEORGE ROBERTSON, Melbourne, Sydney, Adelaide, and Brisbane.

## THE COLLIERY READY-RECKONER AND

CALCULATOR.

By JAMES IRELAND

"Will be the means of preventing many disputes between paymasters and colliers."—Mining Journal.

To be had on application at the MINING JOURNAL Office, 26, Fleet-street, E.C.

**M. P. S. HAMILTON** (late Chief Commissioner of Mines

the Province of Nova Scotia), PRACTICAL GEOLOGIST, MINING

AGENT, and MINING ENGINEER, HALIFAX, NOVA SCOTIA.

PURCHASES and SALES of MINING PROPERTY effected, with a view to the interests of clients.

## MONEY LENT, at EIGHT, NINE, and TEN PER CENT.

FIRST MORTGAGE of FREEHOLDS for IMPROVEMENT

STOCKING, said freeholds in the Province of MANITOBA.

Address, HERBERT C. JONES, Solicitor, 20, Masonic Hall, Toronto.

## PHILLIPS MONTHLY MACHINERY REGISTER

THE BEST MEDIUM IN THE KINGDOM

FOR THE

PURCHASE OR SALE

OF

NEW OR SECONDHAND MACHINERY.

Subscription, 4s. per annum, post free.

PUBLISHERS AND PROPRIETORS,

CHARLES D. PHILLIPS, NEWPORT MON.



TANGYES LIMITED, CORNWALL WORKS, BIRMINGHAM.

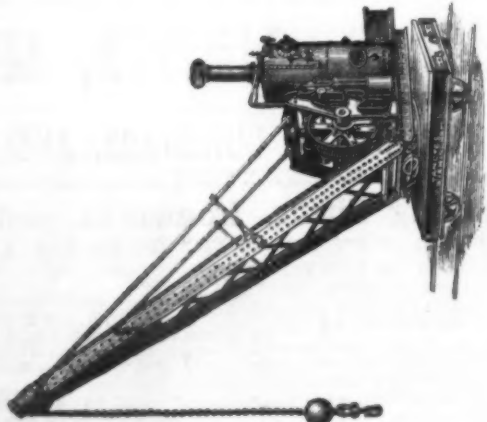
GLASGOW: Argyle and Hope Streets.

MANCHESTER: Deansgate.

NEWCASTLE: St. Nicholas Buildings.

LONDON: 35, Queen Victoria Street.

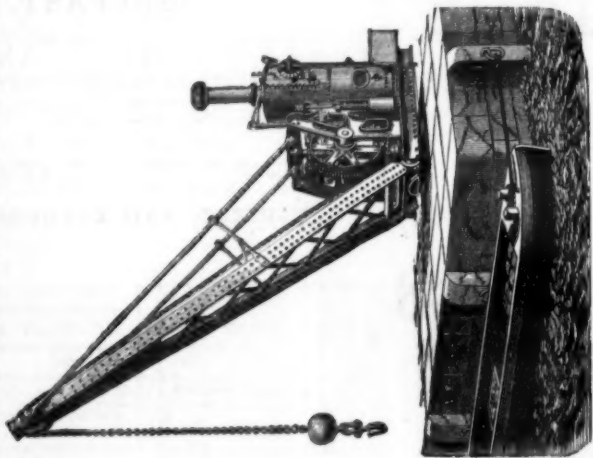
TANGYES' PORTABLE STEAM CRANE.



This Crane lifts the specified weight with single chain and double gear. The 7-ton also lifts its maximum load with double chain and double gear. Price includes sufficient chain, with hook and ball, to reach ground level.

Tested to	Radius	Price	Steam self-protection gear without load	Canopy to protect driver	Clips for rails per set
3 tons	15 ft.	£280	40	£14	50/-
4 "	16 "	330	50	16	55 "
5 "	17 "	380	60	18	60 "
6 "	18 "	430	70	20	65 "
7 "	19 "	480	80	22	70 "

TANGYES' STATIONARY STEAM CRANE.



Price includes sufficient chain, with hook and ball, to reach ground level.

Tested to	Radius	Price	Canopy to protect driver
3 tons	15 ft.	£380	£14
4 "	16 "	330	16
5 "	17 "	380	18
6 "	18 "	430	20
7 "	19 "	480	22

TANGYES' FIXED STEAM CRANE  
For Ships' Decks, Wharves, &c.

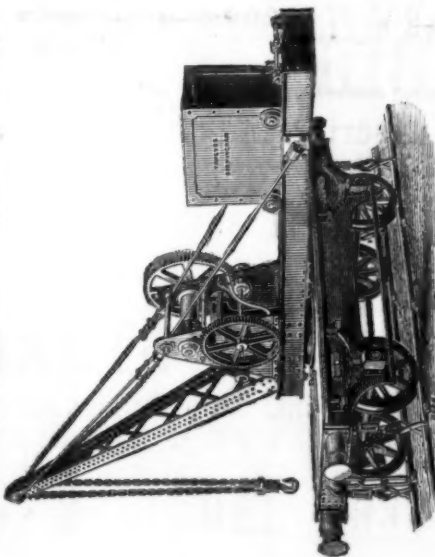


This Crane has two cylinders fixed on Crane Frames. The slaving is effected by friction clutches and spur gearing. The motion can be reversed by a simple throw of clutch handle. A powerful Foot Brake is provided for lowering. The Crane Foot is a best hammered iron forging. The Engines work at 40 lbs. steam pressure, and lift the load with single chain and single purchase, except the three ton size, which has double purchase.

Prices includes sufficient chain, with hook and ball, to reach ground level.

Tested to	Radius	Price	Canopy to protect driver
1 ton	15 ft.	£125	£15
2 "	16 "	155	16
3 "	17 "	185	18
4 "	18 "	215	20
5 "	19 "	245	22

TANGYES' POWERFUL RAILWAY ACCIDENT CRANE.

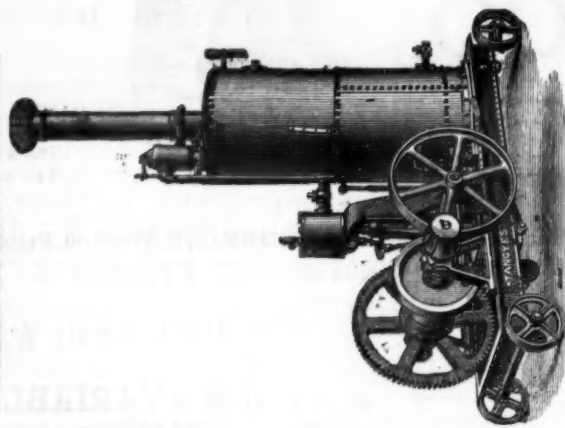


Mounted on strong wrought-iron carriage with wheels 3 ft. diam., 4 ft. 8 1/2 in. gauge, and axle boxes; wrought-iron tail plates. Cast-iron balance box worked by screw with cast-iron tube to protect same. Lowering brake. Jib 18 ft. radius, to lower down entirely or fix at various angles without varying the position of the anti-friction pulley below. Slatch Block and sufficient Chain to reach ground and clips for rails.

Tested to 5 tons	Price
10 "	£370
15 "	£365

This Crane can be made with pitch chain wheel or barrel as desired. Our Patent Safety Brake, as described in catalogue, can be applied to above Crane at a slight extra cost. This Brake has the valuable property of safety sustaining the load when the men have left the handles.

TANGYES' PORTABLE STEAM HOISTING ENGINE.

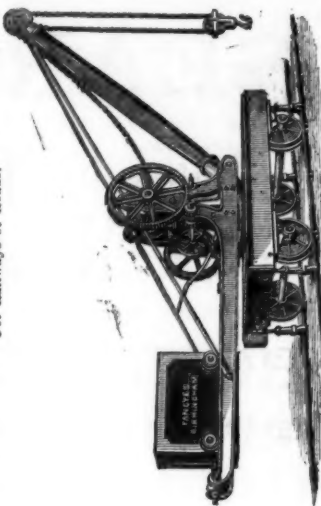


This engine will raise the specified weight at a speed of about 100 ft. per minute. It is fitted with link motion reversing gear, and friction brake. The hoisting barrel may be thrown out of gear. The engine and boiler are fixed on a wrought-iron carriage, which forms the tank for supplying the boiler with water. Either flanged wheels for rails or flat for ordinary roads can be supplied.

Tested to	Price	Hoisting engine on cast-iron base, without feed pump, boiler, or wheels	Warping barrels, extra	40/-
12 cwt.	£135	£80		
20 "	175	105		

No governor supplied with these hoisting engines.

TANGYES' PORTABLE HAND CRANE.  
For Railways or Roads.

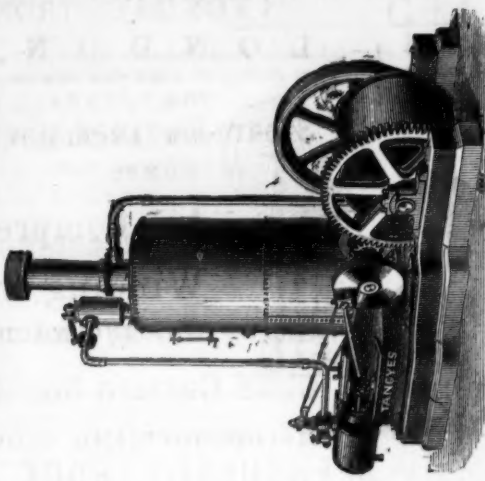


With single and double purchase lifting gear, powerful strap brake and lever, two winch handles, strong iron column and bed-plate, turned roller path, adjustable balance box, which may be regulated according to the weight raised, wood jib, sufficient chain with block to reach ground level, the whole mounted upon strong wood-framed travelling carriage, with four cast-iron wheels, with wrought-iron axles for rails of any gauge, sufficient to afford the necessary base for stability.

Tested to	Radius	Price	Clips, extra
12 cwt.	8 ft.	£31	30/-
1 ton	9 "	33	30 "
2 "	10 "	35	40 "
3 "	11 "	38	50 "
4 "	12 "	40	60 "
5 "	13 "	42	65 "
6 "	14 "	44	70 "
7 "	15 "	46	75 "
8 "	16 "	48	
9 "	17 "	50	
10 "	18 "	52	
11 "	19 "	54	
12 "	20 "	56	

The 12 cwt. and 1 ton Cranes have single purchase gear only and fixed balance boxes. This Crane can be supplied with wrought-iron tubular, or plated jibs, and wrought-iron carriage with chequered iron floor plates, at an extra cost. Our Patent Safety Brake, as described in catalogue, can be applied to above Crane at a slight extra cost. This Brake has the valuable property of safety sustaining the load when the men have left the handles. In ordering, state gauge of rails or if required for roads.

TANGYES' IMPROVED STEAM HOISTING ENGINE.

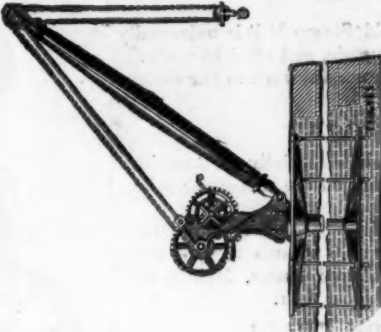


This arrangement consists of a "Tangyes" engine with feed pump, spur pinion on the engine shaft, working into a spur wheel on the drum shaft, cast-iron drum with rope groove, and friction clutch, to throw the drum in and out of gear. The boiler has a cast-iron base, and is fitted with a winding drum can be thrown out of gear and the engine then used for driving purposes.

Diam. cylinder	Length Stroke	Speed rope per minute	Tested	Price	Approx. weight
6 in.	12 in.	200 ft.	7 cwt.	£140	65 cwt.
8 "	16 "	250 "	10 "	185	95 "
9 "	18 "	300 "	12 "	225	110 "

Link motion, reversing gear, extra.

TANGYES' HAND WHARF CRANE.



With single and double purchase lifting gear, powerful strap brake and lever, two winch handles, strong iron crane post and foundation plates and bed-plate, wood jib, turned roller path, sufficient chain, with block, to reach ground level.

Tested to	Radius	Price
12 cwt.	8 ft.	£23
1 ton	9 "	33
2 "	10 "	35
3 "	11 "	38
4 "	12 "	40
5 "	13 "	42
6 "	14 "	44
7 "	15 "	46
8 "	16 "	48
9 "	17 "	50
10 "	18 "	52

The 12 cwt. and 1 ton Cranes have single purchase gear only. This Crane can be supplied with wrought-iron tubular, or plated jibs, and wrought-iron carriage with chequered iron floor plates, at an extra cost. Our Patent Safety Brake, as described in catalogue, can be applied to above Crane at a slight extra cost. This Brake has the valuable property of safety sustaining the load when the men have left the handles.



## MINING MACHINERY, MILLING MACHINERY

Of the MOST APPROVED AMERICAN PATTERNS.

### GOLD MILLS.

The California pattern of Gold Stamp Mill is universally accepted as the most perfect, economic, and efficient made.

We have over 900 stamps in successful work in the various Western Gold Districts.

### SILVER MILLS.

Silver amalgamation in Pans is essentially an American system evolved after years of work on the rich silver mines of Nevada.

We have over 500 Stamps, with necessary pans, settlers, roasting furnaces, &c., all of our own manufacture, at work in different silver camps of the United States, Mexico, and South America, and Philippine Islands, Asia.

### CONCENTRATION MILLS

Of the most approved German pattern and arrangement, or with Stamps and Frue Vanner Concentrators for low grade silver ores, light in lead. We have over 20 large German pattern mills at work on lead, zinc, or copper ores, and numerous Vanner mills on ores never before successfully concentrated.

Mining Pumps, Cornish pattern, of the largest sizes. Hoisting Engines, from 4 h.p. up to the largest direct-acting engines to sink 3000 feet.

### SMELTING WORKS.

We have 80 Water Jacket Smelting Furnaces in use from 20 in. circular up to 54 in. by 60 in. for lead and silver smelting; and special High Jacket Furnaces for copper ores.

Engines of any size, plain slide valve, Corliss, compound Corliss, Boilers, all sizes. Leaching Mills, Hallidie Wire Rope Tramways, Comet Crusher, with capacity of 12 to 20 tons per hour. White, Howell, Bruckner, and Stetefeldt Roasting Furnaces, &c.

We have had twenty years experience in the manufacture solely of MINING MACHINERY, and have special facilities for shipping to all foreign parts through our New York Office, where all details of clearance, shipment, and insurance are conducted. Our machinery is already well known in Mexico, Peru, Chili, Venezuela, Honduras, and other South American countries.

Correspondence solicited. Descriptive Circulars and Catalogues on application

### FRASER AND CHALMERS.

PRINCIPAL OFFICE AND WORKS.

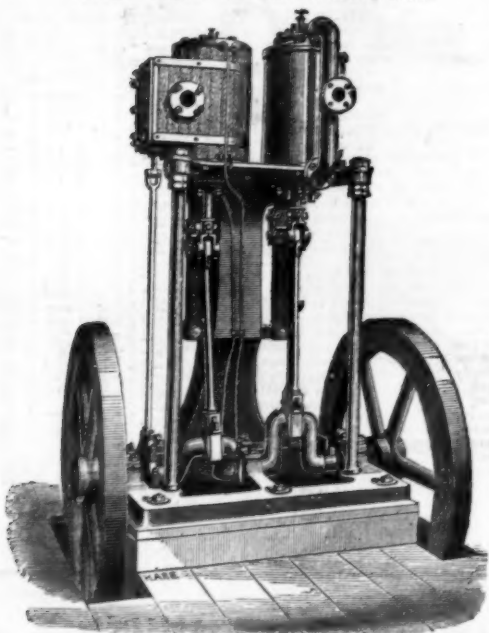
Fulton and Union Streets,  
Chicago, Ill., U.S.

NEW YORK OFFICE.

No. 2, Wall Street,  
New York, U.S.

COLORADO OFFICE—CHEESMAN BLOCK, DENVER.

## THE "Champion" Rock-borer AND AIR COMPRESSOR.



As an instance of the actual work done by this Machinery in various kinds of ground, some of it the hardest rock, it may be mentioned that in Cornwall, irrespective of the work performed by the "Champion" Rock-borers and Air-compressors purchased by various Mines, the drivage, rising, sinking, and stopping done by contract by the Proprietor with his own Machinery now amounts to over 1150 fathoms.

Several of these Air-compressors, ranging from 3½ to 12 tons in weight may be seen in constant work in the Camborne Mining District.

**R. H. HARRIS,**  
ENGINEER,

63, QUEEN VICTORIA STREET, LONDON.

KIRKSTALL, BOWLING, AND STAFFORDSHIRE BAR IRON

**RAILS—RAILS—RAILS—**

New, slightly defective.

F.B. SECTION—BULL HEAD—DOUBLE HEAD—

10, 12, 14, 16, 18, 20, 24, 30, 40, 50, 60, 70, 75, 80 lb. per yard.

Sections on application to

**WILLIAM FIRTH, WATER LANE, LEEDS.**

POINT and CROSSINGS with all Fittings complete.

2500 tons in stock ready for delivery.

## CLAYTON AND SHUTTLEWORTH, STAMP END WORKS, LINCOLN, AND 78, LOMBARD STREET, LONDON

The Royal Agricultural Society of England have awarded Every First Prize to CLAYTON and SHUTTLEWORTH for Portable and other Steam Engines since 1863, and Prizes at every Meeting at which they have competed since 1849.



GOLD MEDAL AND FIRST CLASS CERTIFICATE at the Calcutta International Exhibition 1883-4.

THE ONLY GOLD MEDAL  
AWARDED FOR  
PORTABLE STEAM ENGINES.

### Steam Engines, portable & fixed

For Coals, Wood, Straw, and every kind of Fuel.

OVER 21,500 SOLD.

### Thrashing Machines.

OVER 19,500 SOLD.

### Straw, Corn, and Hay Elevators

### Chaff Cutters for Steam Power

### Grinding Mills.

### Saw Benches.

### Traction Engines, &c.

GOLD MEDALS AND OTHER PRIZES have been awarded CLAYTON AND SHUTTLEWORTH at all the important International and Colonial Exhibitions, including LONDON, 1851 and 1862; PARIS, 1855, 1867, and 1878; VIENNA, 1857, 1866, and 1873.

Catalogues in English and all European Languages free on application.

## THOMAS TURTON AND SONS,

MANUFACTURERS OF

Cast Steel for Mining and other Tools, Shear, Blister, and Spring Steel  
FILES OF SUPERIOR QUALITY.

EDGE TOOLS, HAMMERS, PICKS, AND ALL KINDS OF TOOLS FOR RAILWAYS, COLLIERIES, ENGINEERS, AND CONTRACTORS.  
LOCOMOTIVE ENGINE, RAILWAY CARRIAGE, AND WAGON SPRINGS AND BUFFERS.

**SHEAF WORKS, AND SPRING WORKS, SHEFFIELD.**

LONDON OFFICES:—90, CANNON STREET, E.C.

## POTENTITE.

This unrivalled Explosive, as manufactured by the New and Perfected Machinery of the Company, is perfectly safe in transit, storage, and use, and is employed in every description of Mining or Quarrying Work, for Tunnelling, Pit Sinking, Engineering Work, and Submarine Operations, with the most complete success and satisfaction.

Potentite does NOT contain its own MEANS OF IGNITION, is free from Nitro-Glycerine, and its SAFETY has been specially demonstrated by public experiments.

Its strength is unequalled.

Its action is certain.

In action it gives off neither flame, smoke, nor offensive smell. By its use labour is economised, as work can be resumed immediately after the shot is fired.

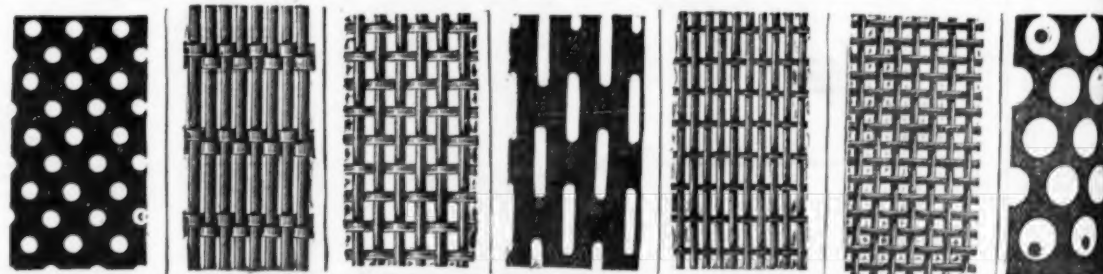
POTENTITE is specially adapted for export to hot climates, as it is unaffected by heat, and is free from dangerous exudations.

POTENTITE IS THE SAFEST STRONGEST, AND WORK FOR WORK, CHEAPEST EXPLOSIVE IN THE MARKET.

For particulars and prices, apply to—

**THE POTENTITE COMPANY, LIMITED.**

HEAD OFFICE—5, FENCHURCH AVENUE, LONDON, E.C.



Extra Treble Strong Wire Cloth and Perforated Metals in Steel, Iron, Copper, Brass, Zinc, Bronze.

Made in all Meshes and Widths.

**N. GREENING & SONS, Limited,**

Wire Manufacturers and Metal Perforators,

**WARRINGTON.**

Jigger Bottoms, Trommels, Cylinder Covers, Riddles, Sieves for Diamond, Gold, Silver, Copper, Lead and Tin Mines.

Samples and Prices free on application.

## FRANCIS MORTON AND CO., LIMITED, LIVERPOOL

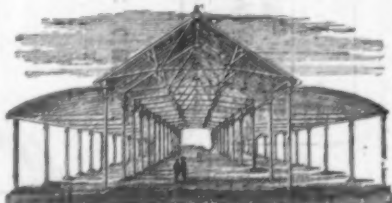
MANUFACTURERS OF

**GALVANISED CORRUGATED IRON ROOFS, BUILDINGS, AND SHEDDING,**

WHICH THEY HAVE EXTENSIVELY ERECTED FOR THE REQUIREMENTS OF

**Forges, Rolling Mills, Puddling Sheds, Ironworks, and Collieries**

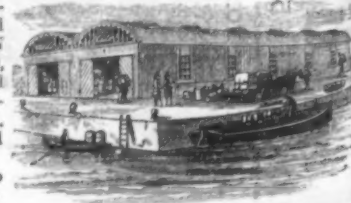
Erected Complete in this Country, or prepared to Plan for Erection Abroad.



OPEN SHED FOR COVERING LARGE AREAS

GALVANISED OR PAINTED CORRUGATED IRON ROOFING PLATES and TILES. HEAVY CORRUGATED IRON PLATES for fireproof floors, roadways, parapets, &c. (for producing which F.M. and Co. have recently laid down powerful Hydraulic Machinery). Wrought-iron Tanks, Guttering, and General Constructional Wrought Ironwork.

DESIGNS PREPARED, AND ILLUSTRATED DESCRIPTIVE CATALOGUES FORWARDED ON APPLICATION



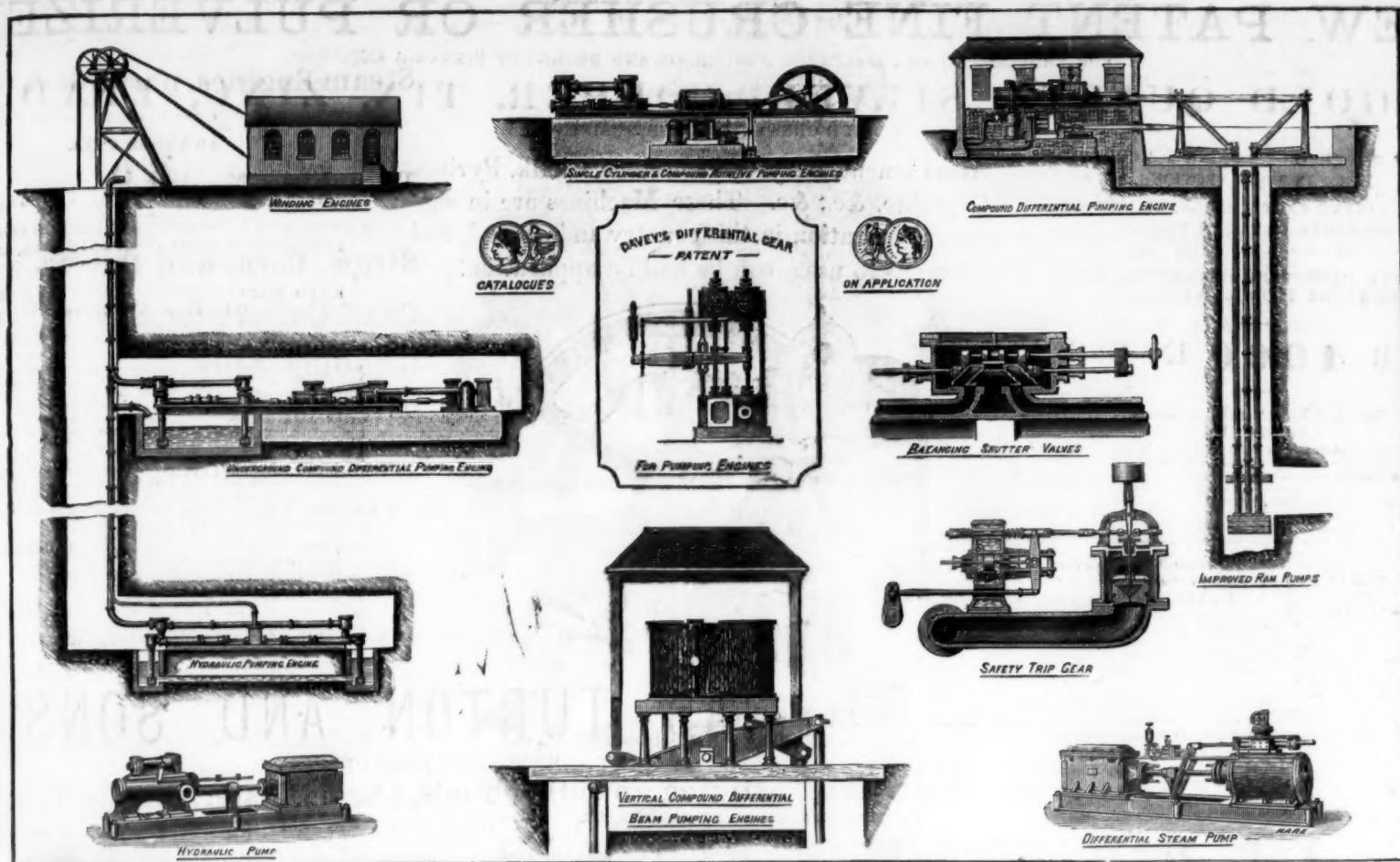
GENERAL STORE FOR WHARF, ETC.

London Office: 9, Victoria Chambers, Victoria Street, Westminster, S.W.  
(Rooms Nos. 27 and 28, on the First Floor.)



# HATHORN, DAVEY & CO.,

PUMPING MACHINERY.  
 Elevator Power  
 n awarded  
 the impo  
 ing



MINING MACHINERY.

## SUN FOUNDRY, LEEDS.

## BELL'S ASBESTOS.

BELL'S PATENT ASBESTOS BLOCK PACKING for High-Pressure Engines.

The following testimonials refer to this Packing—

Mons Lodge, Amlwich, Anglesey, 2nd August, 1884.

DEAR SIR,—I have much pleasure in answering your note. Had times in mining have come to me to try all kinds of expedients in order to effect saving; some have succeeded and some have failed, but my underground manager, Capt. Hughes, has just said to me by the telephone—“The Asbestos Packing is the best thing ever brought here.” It saves money and trouble, but like any gas purifying oxide it lasts so long that you must not expect another order from me for twelve months at least.

Yours truly, T. F. EVANS, Late H.M. Inspector of Metalliferous Mines.

Manchester, Sheffield, and Lincolnshire Railway—Steamship Department, Grimsby, April 10th, 1884.

DEAR SIR,—I have much pleasure in stating that after a trial of over nine months, and comparing it with other packings, I can confidently recommend your Asbestos Packing. It is especially valuable when high-pressures are employed, as in cases where other packings have perished, due to high temperatures, your packing has invariably stood well. I have also used it with complete success when a gland has been heated with other packings, and also in cases of badly scored and worn rods. I consider the results I have obtained by its use for our marine engines to have been in every way highly satisfactory.

Yours truly, G. H. CLARKE, Sup. Engineer.

Department of the Director of Navy Contracts, Admiralty, Whitehall, 20th June, 1884.

DEAR SIR,—I have to inform you that your tender has been accepted for Bell's Holed Cloth Asbestos Packing to sample submitted:—Elastic core ... .. Round.

To Mr. John Bell, JOHN COLLETT, Director of Navy Contracts.

The Patent Block Packing is square, as Fig. 1 and Figs. 2 and 3 represent the Round Block Packing with solid and hollow rubber core, and Fig. 4 without core, but with an internal. As these packings are extensively imitated, and as it is a common practice among dealers and agents to supply the cheaper manufactures at my list prices, I am requested to see that the packing supplied to them bears the trade mark.

BELL'S ASBESTOS BOILER PRESERVATIVE.—This useful mixture absorbs the free oxygen that is in the water entirely checks pitting and corrosion, and disintegrates incrustation so immediately as to prevent its adhering to the plates. Not only is a great economy of fuel effected by keeping boilers clean, but the risk of having the plates burned is thereby obviated. It has been computed that the loss of incrustation causes a waste of 15 per cent. of coal;  $\frac{1}{4}$  in., 60 per cent.;  $\frac{1}{2}$  in., 150 per cent. Thus the Preservative avoids the great risks which are inseparable from scaled plates, lengthens the life of a boiler, and covers its own cost a hundredfold by economy of fuel. It is entirely harmless, and has no injurious action on the boiler.

It can be put into the feed tank or boiler, as may be most convenient.

Drums and casks bearing the Trade Mark, without which none is genuine.

BELL'S ASBESTOS YARN and SOAPSTONE PACKING.

Locomotives and all Stationary Engines running at very high speed with ease and friction.

Handwell Park Colliery, Smethwick, 1st February, 1884.

To Bell's Asbestos Works.

DEAR SIR,—I have much pleasure in stating that I have used your Asbestos Packing for the last 13 months for our large winding engines which are running night and day, and also for the fan, pumping, and hauling engines at the above Colliery, and during that period we have not used more than one-third the Packing we had formerly; and this I attribute to your Packing on account of its great durability and excellent excellence of quality.—I am, dear Sirs, yours faithfully,

THOMAS WINTER, Colliery Engineer.



TRADE MARK.

BELL'S ASBESTOS.

The goods of this house are of the highest quality only, and no attempt is made to compete with other manufacturers by the supply of inferior materials at low prices. All “home” orders should be sent direct to the undermentioned depots and not through Agents or Factors.

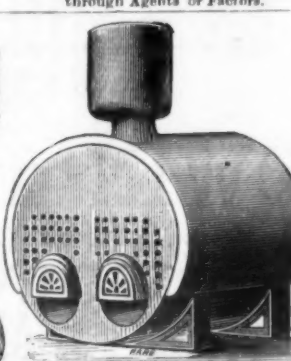


FIG. 4.

BELL'S ASBESTOS BOILER AND PIPE COVERING COMPOSITION, for coating every class of steam pipes and boilers, non-combustible and easily applied when steam is up; adheres to metals and preserves them from rust; prevents the unequal expansion and contraction of boilers exposed to weather; covers 50 per cent. more surface than any other coating, and is absolutely indestructible. It can be stripped off after many years' use, mixed up with 20 per cent. of fresh, and applied again. The composition is supplied dry, and is only to be mixed with water to the consistency required for use.

A Horizontal Boiler, 17 ft. 6 in. long, 15-H.P. gave the following results:—

Temperature on Plates - - - 196 deg.

Covering - - - 94 deg.

One ton of coal was saved per week, and although the fire was raked out every evening, 20 lbs. of steam were found in the boiler next morning.

The following Testimonials refer to this Covering:—

DEAR SIR,—It may interest you to know that we have exactly 40 per cent. in fuel through using your covering.

Yours truly, W. SANTO CHIMP, C.E., F.G.S.

The Tamar and Kit Hill Granite Company (Limited), Gunnislake, Tavistock, 8th April, 1884.

Mr. John Bell, Southwark, S.E.

SIR,—I have much pleasure in stating that the Asbestos covering applied by you to the boiler of our travelling crane at Kit Hill has yielded most remarkable results. Since it has been in use we have saved fully half our coal, and have effected a great saving in the time it takes to get up high gantries, and is fully exposed to all weather. I have formed the highest opinion of your Asbestos as used for this purpose, and as you are aware, have had another boiler similarly covered, though it has not since been used. I can most strongly recommend the material.

I am, Sir, yours faithfully, W. J. CHALK, Assoc. M. Inst. C.E., Engineer and Manager.

BELL'S ASBESTOS and INDIA-RUBBER WOVEN TAPE and SHEETING, for making every class of Steam and Water Joints. It can be bent by hand to the form required without puckering, and is especially useful in making joints of manhole and mudhole doors. It is kept in stock in rolls of 100 ft., from  $\frac{1}{2}$  in. to 3 in. wide, and any thickness from  $\frac{1}{4}$  in. upwards. Manhole covers can be lifted many times before the renewal of the jointing material is necessary. The same material is made up into sheets about 40 in. square, and each sheet bears the Trade Mark, without which none is genuine. It is very necessary to guard against imitations of this useful material, and to secure themselves against being supplied with these inferior articles at my price, users are recommended to see that every 10 ft. length of the Asbestos Tape purchased by them bears the Trade Mark.

BELL'S SPECIAL LONDON-MADE ASBESTOS MILLBOARD, for Dry Steam Joints, made of the best Asbestos fibre, is well-known for its toughness and purity, and is absolutely free from the injurious ingredients frequently used to attain an appearance of finish, regardless of the real utility of the material. Made in sheets measuring about 40 in. square, from 1-5th in. to 1 in., and  $\frac{1}{2}$  millimetre to 25 millimetres thick. Each sheet bears the Trade Mark.

The following copy of acceptance of tender refers to above:—

Department of the Director of Navy Contracts, Admiralty, Whitehall, S.W., 17th May, 1884.

SIR,—I have to inform you that your tender for Asbestos Millboard has been accepted.—Mr. John Bell.

JOHN COLLETT, Director of Navy Contracts.

BELL'S ASBESTOS EXPANSION SHEETING (PATENT). This

Sheeting is another combination of Asbestos with India-rubber, giving to the steam user the special advantages of both materials. The India-rubber Washer is protected from the action of heat and grease by an outer coating of vulcanised Asbestos Cloth, thus producing an excellent joint where expansion and contraction render other materials unserviceable. This material is admirably suited to steam pipe joints and every class of valve. Valves made of this material are very durable, as they are not subject to injury by oil.

FIG. 1.

FIG. 2.

FIG. 3.

FIG. 4.

## BELL'S "ASBESTOS LUBRICANT"

"REGD."

ILLUSTRATED PRICED CATALOGUE FREE ON APPLICATION TO

BELL'S ASBESTOS WORKS, SOUTHWARK, LONDON, S. E.

OR THE DEPOTS—119c, SOUTHWARK STREET, S.E.

Victoria Buildings, Deansgate, MANCHESTER.

11 and 13, St. Vincent Place, GLASGOW.

39, Mount Stuart Square, CARDIFF.

21, Ritter Strasse, BERLIN.



## THE BLAKE-MARSDEN NEW PATENT IMPROVED STONE BREAKERS AND ORE CRUSHERS.

ORIGINAL PATENTEE  
AND ONLY MAKER.ALSO PATENTEE AND  
MAKER OF THE**H. R. MARSDEN,**  
**NEW PATENT FINE CRUSHER OR PULVERIZER**

FOR REDUCING TO AN IMPALPABLE POWDER, OR ANY DEGREE OF FINENESS REQUIRED.

**GOLD QUARTZ, SILVER, COPPER, TIN, ZINC, LEAD**

AND ORES OF EVERY DESCRIPTION

PATENT REVERSIBLE RUBBING and CRUSHING  
JAWS, IN FOUR SECTIONS,  
WITH PATENT FACED BACKS, REQUIRING  
NO WHITE METAL IN FIXING.CRUCIBLE CAST-STEEL CONNECTING RODS.  
RENEWABLE TOGGLE CUSHIONS, &c.

OVER 4000 IN USE.

EXTRACTS FROM TESTIMONIALS.  
PULVERIZER.

"I have great pleasure in bearing testimony to the merits and capabilities of your patent combined fine crusher and sieving apparatus. I have tried it on a variety of ores and minerals, and it pulverizes them with equal success. You can put in a small paving stone and bring it out like flour."

"In reply to your favour, I have much pleasure in informing you that the 12x3 Pulverizer we had from you is giving us every satisfaction. The material we are operating on is an exceptionally hard one. I am well satisfied with its working."

"Our experience is that the motion and mechanical arrangements of your machine are the best for pulverizing that we have ever met with."

"The reports from our mines as regards the working of your Fine Crusher (20x5) recently supplied are very favourable, although we cannot quote you exact figures. On being got into position it was tried by hand, with the result that it made short work of the biggest pieces of ore we put into the hopper. You might say how long you would take to deliver another of the same size."

"As I once before stated, your machine is a perfect pulverizer."

"I am sure the machine will be a success, and a great one, and there is any amount of demand for such a machine. We can work it with 20 lbs. of steam, and our engine, which is a 12-h.p., plays with the work, in fact we run the Stonebreaker and the Pulverizer both together with 35 lbs."

Also Cement, Barytes, Limestone, Chalk, Pyrites, Coprolite, &amp;c., &amp;c. These Machines are in successful operation in this country and abroad, and reference to users can be had on application.

AWARDED OVER

60

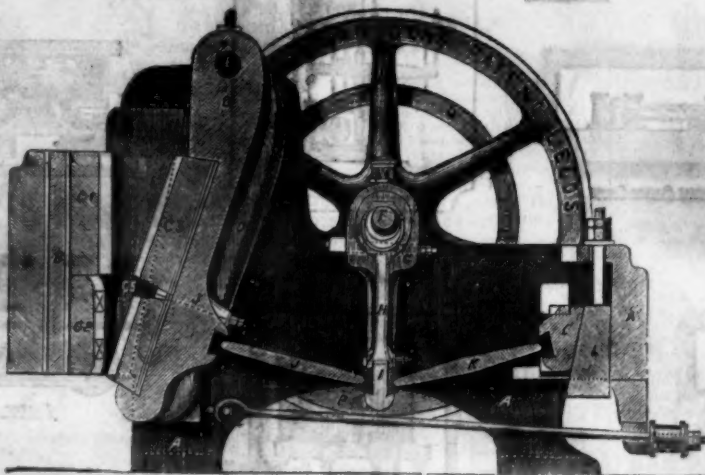
FIRST-CLASS GOLD AND SILVER MEDALS

ADOPTED BY THE PRINCIPAL CORPORATIONS OF  
TRACTORS, MINING COMPANIES, &c., IN  
PARTS OF THE WORLD.ROAD METAL BROKEN EQUAL TO HAND  
ONE-TENTH THE COST.

## EXTRACTS FROM TESTIMONIALS.—STONEBREAKER.

"I now order Three of your Stone Crushers, size 15 x 12, your very best construction, and to include two extra sets of Cheeks for each. The last two 24 x 12 machines you which are at work in this colony, are doing very well, and find that the railway contractors will adopt your preference to the colonial ones—two of which I have. The contractors have had as many as nine of them, which have very good satisfaction. Once they know of yours they believe you will do a good trade with the colonies. For the high character of your constructions you can refer having used them with the very best results, both in New and this colony, and much prefer them to the colonial ones in point of construction and less liability to go out of order. Material we are crushing is very hard blue stone, for railway purposes. Push on with the order as quickly as possible, I think it necessary to have any engineering inspection brought your machines prominently under the notice of contractors in this colony, likewise the Government. Many contractors have spoken to me in reference to their capabilities. I could only tell them that they are by far and away the most economical I ever used. The very fact of me having now eleven from you at various intervals and various sizes, above 12 years ago, and having tried all the other makes, is a guarantee of the capabilities and the working of your machines in every way surpasses all others."

"Some of your testimonials do not give your machines due. I have seen men hammering away on a big rock for a day which your machine would reduce to the required quarter of a minute. I would guarantee that your largest machine would reduce more of the Cornish tin capsels (the hardest rock of England) in a day than 100 men, and at less cost."



GREATLY REDUCED PRICES ON APPLICATION.

FOR CATALOGUES, TESTIMONIALS, &c., APPLY TO THE SOLE MAKER,  
**H. R. MARSDEN, SOHO FOUNDRY, LEEDS.****JOHN CAMERON'S**

FLY-WHEELS ON BOTH SIDES.

SPECIALITIES ARE HIS

**STEAM PUMPS**

FOR

**COLLIERY PURPOSES.**

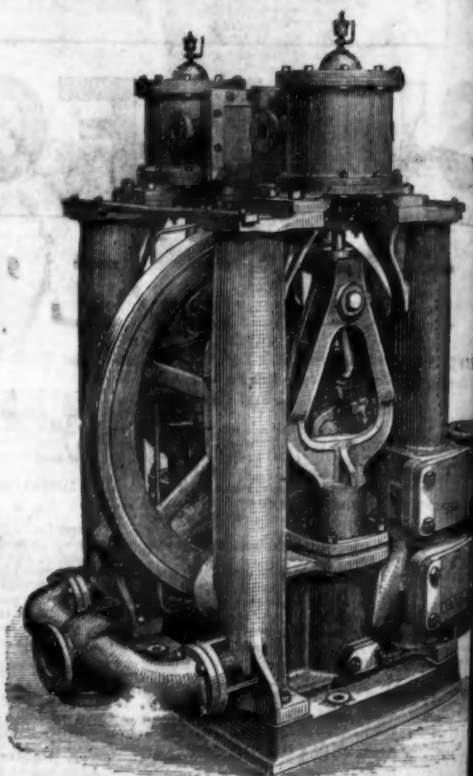
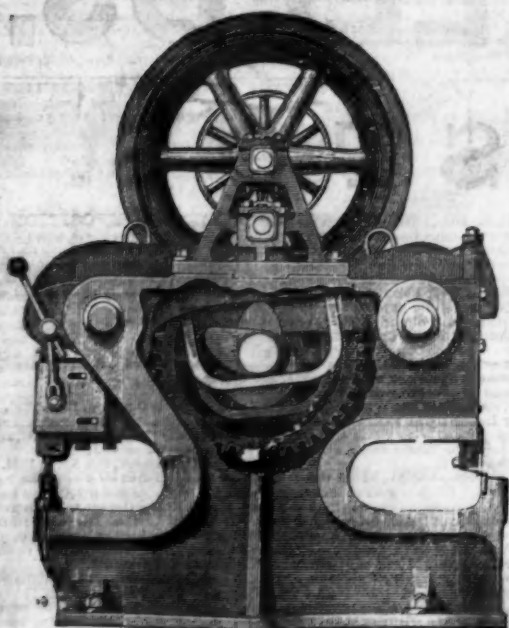
Specially adapted for forcing Water any height

ALSO, FOR

**SINKING, FEEDING BOILERS AND STEAM  
FIRE ENGINES,**

Of which he has made over 9000.

ALSO, HIS

**PATENT CAM AND LEVER  
PUNCHING & SHEARING MACHINES.**Works: Oldfield Road, Salford,  
Manchester.AGENTS { For LONDON and DISTRICT—PRICE and BELSHAM,  
21, QUEEN VICTORIA STREET, E.C.  
For NEWCASTLE and EAST-COAST—E. BECKWITH AND CO.,  
BONNERSFIELD, SUNDERLAND.

By a special method of preparation this leather is made solid, perfectly close in texture, and impermeable to water; it has, therefore, all the qualifications essential for pump buckets, and is the most durable material of which they can be made. It may be had of all dealers in leather, and of—

**HEPBURN AND GALE, LIMITED,**  
TANNERS AND CURRIERS,  
LEATHER MILL BAND AND ROSE PIPE MANUFACTURERS,  
LONG LANE, SOUTHWARK, LONDON.  
Prize Medals, 1861, 1866, 1878, for  
MILL BANDS, ROSE, AND LEATHER FOR MACHINERY PURPOSES.

W. F. STANLEY

**MATHEMATICAL INSTRUMENT MANUFACTURER TO H.M.**  
GOVERNMENT, COUNCIL OF INDIA, SCIENCE AND  
ART DEPARTMENT, ADMIRALTY, &c.**MATHEMATICAL, DRAWING and SURVEYING INSTRUMENTS** of every  
description, of the highest quality and finish, at the most moderate prices.

Price List post free.

ENGINE DIVISION TO THE TRADE.

ADDRESS—GREAT TURNSTILE, HOLBORN, LONDON, W.C.

**THE IRON AND COAL TRADES REVIEW**The IRON AND COAL TRADES REVIEW is extensively circulated amongst the  
Iron Producers, Manufacturers, and Consumers, Coalowners, &c., in all the iron  
and coal districts. It is, therefore, one of the leading organs for advertising every  
description of Iron Manufactures, Machinery, New Inventions, and all matters  
relating to the Iron, Coal, Hardware, Engineering, and Metal Trades in general.  
Office of the Review: 342, Strand, W.C.

Remittances payable to W. T. Fringle.

ESTABLISHED 1825.

**EDWIN LEWIS AND SONS,**

Patent Tube Works, MONMORE GREEN and Britannia Boiler Tube Works, ETTINGHAM

**WOLVERHAMPTON.**

MANUFACTURERS OF

Lapwelded &amp; Buttwelded Wrought-iron, Steel, or Homogeneous Tube

FOR EVERY

**COLLIERY OR MINING PURPOSE.****J. WOOD ASTON AND CO., STOURBRIDGE**

(WORKS AND OFFICES ADJOINING CRADLEY STATION),

Manufacturers of

**CRANE, INCLINE, AND PIT CHAINS**

Also CHAIN CABLES, ANCHORS, and RIGGING CHAINS, IRON and STEEL SHOVELS, SP

FORKS, ANVILS, VICES, SCYTHES, HAY and CHAFF KNIVES, PICKS, HAMMERS, NAIL

RAILWAY and MINING TOOLS, FRYING PANS, BOWLS, LADLES, &amp;c., &amp;c.

Crab Winches, Pulley and Snatch Blocks, Screw and Lifting Jacks, Ship Knees, Forgings, and Use Iron of all descriptions

**WELDED STEEL CHAINS { FOR CRANES, INCLINES, MINES, &c.,**  
MADE ALL SIZES.